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# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

## **THESIS**

**A PROPOSED ARCHITECTURE FOR THEATER  
COORDINATION OF GLOBAL SPACE CAPABILITIES**

by

Daniel P. Arthur  
Dennis G. Wille

September 2006

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<b>REPORT DOCUMENTATION PAGE</b>			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
<b>1. AGENCY USE ONLY (Leave blank)</b>		<b>2. REPORT DATE</b> September 2006	<b>3. REPORT TYPE AND DATES COVERED</b> Master's Thesis	
<b>4. TITLE AND SUBTITLE</b> A Proposed Architecture for Theater Coordination of Global Space Capabilities			<b>5. FUNDING NUMBERS</b>	
<b>6. AUTHOR(S)</b> LCDR Daniel P. Arthur, MAJ Dennis G. Wille				
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Naval Postgraduate School Monterey, CA 93943-5000			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> N/A			<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>	
<b>11. SUPPLEMENTARY NOTES</b> The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited.			<b>12b. DISTRIBUTION CODE</b> A	
<b>13. ABSTRACT (maximum 200 words)</b> <p>This thesis proposes an architecture for the coordination of global space capabilities in a joint force commander's theater of operations. The current architecture for space capabilities coordination in a geographic area of operations is not standardized, and is instead left up to each theater to develop independently. As dependence on space capabilities proliferates to the lowest levels of operations, while the capabilities and products provided by space systems becomes increasingly complex, ad hoc relationships are no longer sufficient. Purely because of physics, assets on orbit are global, rather than theater, in nature, and require a global level of control. The interaction of a unified global controlling organization with disparate theater coordination constructs results in confusion, inefficiency, and potentially lost opportunities to influence or support operations. The standardization of space coordination across theaters will ensure that similarly trained and operating organizations are able to interact within their theater, across theaters, and up to the space command and control organization. This thesis proposes the establishment of a theater space coordination cell on the staff of the joint force commander in order to provide theater-wide space capabilities coordination and reach-back to U.S.-based space resources.</p>				
<b>14. SUBJECT TERMS</b> Space, operations, space coordinating authority, space capabilities, theater space coordination			<b>15. NUMBER OF PAGES</b> 104	
			<b>16. PRICE CODE</b>	
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified	<b>20. LIMITATION OF ABSTRACT</b> UL	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)  
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**A PROPOSED ARCHITECTURE FOR THEATER COORDINATION OF  
GLOBAL SPACE CAPABILITIES**

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requirements for the degree of

**MASTER OF SCIENCE IN SPACE SYSTEMS OPERATIONS**

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## **ABSTRACT**

This thesis proposes an architecture for the coordination of global space capabilities in a joint force commander's theater of operations. The current architecture for space capabilities coordination in a geographic area of operations is not standardized, and is instead left up to each theater to develop independently. As dependence on space capabilities proliferates to the lowest levels of operations, while the capabilities and products provided by space systems becomes increasingly complex, ad hoc relationships are no longer sufficient. Purely because of physics, assets on orbit are global, rather than theater, in nature, and require a global level of control. The interaction of a unified global controlling organization with disparate theater coordination constructs results in confusion, inefficiency, and potentially lost opportunities to influence or support operations. The standardization of space coordination across theaters will ensure that similarly trained and operating organizations are able to interact within their theater, across theaters, and up to the space command and control organization. This thesis proposes the establishment of a theater space coordination cell on the staff of the joint force commander in order to provide theater-wide space capabilities coordination and reach-back to U.S.-based space resources.



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## LIST OF SYMBOLS, ACRONYMS, AND ABBREVIATIONS

AF	Air Force
AFDD	Air Force Doctrine Document
AOC	Air Operations Center
AOR	Area of Responsibility
ARCENT	U.S. Army Central Command
ARSST	Army Space Support Team
CAOC	Combined Air Operations Center
CDRJSO	Commander, Joint Space Operations
CENTCOM	U.S. Central Command
CFFC	Commander, U.S. Fleet Forces Command
CJTF	Commander, Joint Task Force
CNO	Chief of Naval Operations
COCOM	Combatant Commander
CONOPS	Concept of Operations
CSG	Carrier Strike Group
DIRMOBFOR	Director of Mobility Forces
DIRSPACEFOR	Director of Space Forces
DOTMLPF	Doctrine, Organization, Training, Material, Leadership & Education, Personnel, and Facilities
EBO	Effects Based Operations
EUCOM	U.S. European Command
FM	Field Manual
FY	Fiscal Year
GPS	Global Positioning System
GSCA	Global Space Coordinating Authority
ISR	Intelligence, Surveillance, and Reconnaissance
JCIDS	Joint Capabilities Integration and Development System
JCST	Joint Space Coordination Task
J(C)FACC	Joint (Combined) Forces Air Component Commander
J(C)FLCC	Joint (Combined) Forces Land Component Commander
J(C)FMCC	Joint (Combined) Forces Maritime Component Commander
JFC	Joint Force Commander
JFCC SGS	Joint Functional Component Commander for Space and Global Strike
JFCC SPACE	Joint Functional Component Commander for Space
JFCOM	Joint Forces Command

JIOC	Joint Information Operations Center
JP	Joint Publication
JROC	Joint Requirements Oversight Council
JSCO	Joint Space Coordination Officer
JSCT	Joint Space Coordination Task
JSOC	Joint Space Operations Center (pre-2005)
JSpOC	Joint Space Operations Center (post-2005)
JTF	Joint Task Force
JWS	Joint Warfighting Space
MAJCOM	Major Command
MEF	Marine Expeditionary Force
MHQ-MOC	Maritime Headquarters with Maritime Operations Center
NAF	Numbered Air Force
NAVSOC	Navy Space Operations Center
NETWARCOM	Network Warfare Command
NIOSC	Network, Information Operations, and Space Center
NORTHCOM	U.S. Northern Command
OIF	Operation Iraqi Freedom
PACOM	U.S. Pacific Command
SCA	Space Coordinating Authority
SCP	Space Coordination Plan
SJFHQ	Standing Joint Force Headquarters
SMDC	Space and Missile Defense Command
SSE	Space Support Element
SSO	Senior Space Officer
SSR	Space Support Request
SOCCOM	U.S. Special Operations Command
SOO	Space Operations Officer
SOUTHCOM	U.S. Southern Command
SSO	Senior Space Officer
TACS	Theater Air Control System
TSCC	Theater Space Coordination Cell
TYCOM	Type Commander
USFK	U.S. Forces Korea
USMC	U.S. Marine Corps
USSTRATCOM	U.S. Strategic Command
WFHQ	War Fighting Headquarters

## **ACKNOWLEDGMENTS**

The authors would like to thank Professor Charles Racoosin and Professor Joe Welch for their support and guidance during the research and development of this thesis. Their efforts as our thesis advisors truly enhanced our academic experience.

We also acknowledge the financial support of Professor Rudy Panholzer, Chairman of the Naval Postgraduate School Space Systems Academic Group, for facilitating field research for material utilized in this thesis.

A great deal of thanks is due to Lt Col Scott Henderson, USAF, and the men and women of the Joint Space Operations Center at Vandenberg AFB, CA for their support in the initial stages of our thesis work. Their willingness to host us for a day and share the beginnings of their organization provided a significant amount of background for our thesis.

We are especially grateful to Col Whelan, USAF and Lt Col Tom James, USA, the CENTCOM Director and Deputy Director of Space Forces. These officers were willing to take time out of their operational schedule to conduct a VTC with us, providing an enormous amount of useful information and perspective. Their selflessness and engagement was invaluable to our work.

Finally, we would like to thank our fellow students in the Space Systems Operations curriculum. Their expertise and service-specific perspectives were enlightening and will provide a lasting resource for the remainder of our military careers.

If we have inadvertently missed anyone in our collective or individual thanks, please accept our apologies and know that we are certainly thankful to each and every person who made a contribution to this thesis.

**MAJ Dennis Wille:**

I would like to express my gratitude to many people who helped make this experience worthwhile. With their ideas, input, and support, they made this thesis possible.

I would like to thank my thesis partner, LCDR Daniel Arthur. His motivation, focus, and willingness to do all the really hard work were phenomenal. It is seldom that two people can join forces on a project of this magnitude and still end up as friends at the end. I will always value LCDR Arthur's efforts on this thesis and also his friendship, which will last a very long time.

I would like to acknowledge the leadership of Captain Al Scott. In his capacity as the Program Officer for the Space Systems Operations curriculum, he has helped in my professional development as both an officer and as a future member of the national security space community.

I would like to thank numerous members of the United States Army for the information, support, and frequent azimuth checks. They include COL Todd Day, LTC Thomas James, LTC Troy McKeown, LTC Richard Wolfe, LTC Gordon Quick, Jr., LTC Clay Scherer, Mr. David Carrithers, and Ms. Patsy Campbell. All of these individuals had a significant impact on my academic experience at the Naval Postgraduate School.

Most importantly, I would like to thank my wife, Shana. Her love and support during these past two years have been overwhelming. I will always be grateful for having her by my side.

**LCDR Daniel Arthur:**

First, I'd like to thank MAJ Dennis Wille, my partner, for the motivation and drive behind this thesis. His insights, big picture thinking, and long-range viewpoint provided the foundation for this work. This thesis is the product of two years of

our conversations and arguments. It would not have been possible without him. I have great respect for his professional bearing and perspective, and look forward to our partnership continuing beyond this school.

Numerous Navy personnel gave generously of their time and effort to assist with the development of this thesis, from its inception to completion. CDR Zigmond Leszczynski from Carrier Strike Group EIGHT has been my cheerleader from the start, providing valuable background and including me in CSG-8's space training process. CDR Michelle Hillmeyer and Mr. Buddy Meyers at Naval Network Warfare Command similarly included me in all aspects of the Naval Space Campaign, ensuring that I had the most up-to-date information and spending time to discuss and debate various concepts. LCDR Scott Blackwell, also at NETWARCOM, is a former shipmate and late addition to the team – he immediately jumped onboard and provided great feedback on the first drafts of the thesis. Thanks too to CDR Alan McQuoid, NETWARCOM Naval Reserve component, for providing me the contacts into the Maritime Headquarters Development organization. Without that information, a significant part of the thesis could not have been developed.

Several active and retired Air Force personnel played a large part in the development of this thesis as well. Col Scott Patton and Maj Dwayne Hall at Air Force Space Command in Colorado Springs went to great lengths to include me in their weekly DIRSPACEFOR VTC, and in a superb time of discussion afterwards. My incomplete understanding of the DIRSPACEFOR was significantly improved by their efforts. Mr. Tom Falconer and Lt Col Richard Wolfe, faculty members of the National Security Space Institute, facilitated an outstanding visit and round-table discussion with other members of the NSSI staff. The opportunity to spend an entire day picking the brains of these experienced personnel was a rare opportunity.

Finally, I want to thank my wonderful wife, Melanie, and my three incredible children, Katherine, Thomas, and Abigail. Their love and support has been tremendous, and I could not have completed this task without them.

## I. SPACE COORDINATION BACKGROUND

The 21<sup>st</sup> century American military has witnessed a significant change in how it takes advantage of National Security Space capabilities. Campaigns such as Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF) provided tactical users at increasingly lower echelons the opportunity to exploit capabilities which had historically been viewed as strategic in nature. This change began in 1991 when the capabilities of GPS and detailed ISR products were made widely available, and has accelerated rapidly during the conduct of OEF and OIF. However, despite the increase in space capabilities available to “warfighters,” the short term solutions implemented for OEF and OIF will not serve as a perfect model for future conflicts.

With the increase in utility of space support to the “warfighter,” warriors are beginning to examine in more detail the coordination relationships that allow this support to happen. A very common example of this utility is in the form of the Joint Direct Attack Munition (JDAM), an air to surface munition guided by the Global Positioning System (GPS). This munition, which is enabled by the space capabilities inherent to the GPS constellation, provides a tactical user a very precise, lethal effect.<sup>1</sup> Another example is the proliferation of tactical satellite communications, which have proven to be a lifesaving capability during the day-to-day operations in the mountains of southeast Afghanistan.<sup>2</sup> One can assume that the existing trend of pushing greater space capabilities into the hands of tactical end users will continue. Despite this trend, providing an increasing amount of capabilities to an increasing number of tactical end users, the problem of properly coordinating these capabilities begins to introduce friction and inefficiency into the system.

---

<sup>1</sup> Jane's Information Group. Jane's Air-Launched Weapons, “Joint Direct Attack Munition (JDAM): GBU-31, GBU-32, GBU-35, GBU-38,” updated 31 July 2006, [www.janes.com](http://www.janes.com), Accessed 9 August 2006.

<sup>2</sup> Christian Lowe, “Nowhere to Hide,” *Marine Corps Times*, May 22, 2006.



The purpose of this thesis is to examine the current theater space coordination architecture that exists in the Central Command (CENTCOM) theater and identify its positive and negative aspects. Additionally, the Army, Navy, and Air Force have each created initiatives to change or enhance the future of theater space coordination. This thesis will review each of those initiatives and will identify the positive and negative aspects of these architectures. The goal of this research is to make a case for a more standardized architecture for theater space coordination to ensure that the customer is receiving the necessary “two cups of space”.

The first step in this process is to identify the most up to date military doctrine that guides the use of space capabilities. Military doctrine should flow from the highest authority to the lowest and from the most general concept to the most specific. In this study, the highest authority would be Joint Publication (JP) 3-14 (Joint Doctrine for Space Operations), from which service specific doctrine should flow. Understanding the terminology and concepts that form the foundation for exploiting space capabilities is foundational to establishing an effective theater coordination architecture. Unfortunately, the current doctrine is not consistent in terminology (as discussed in detail in Chapter II) and some necessary publications are either outdated or nonexistent. For example, JP 3-14 was last published on August 9, 2002, preceding the reorganization of U.S. Strategic Command (USSTRATCOM) and U.S. Space Command in October 2002. Since that reorganization, JP 3-14 has become increasingly less relevant to the current state of affairs for conducting joint space operations. The Navy and Marine Corps do not yet have published space operations related doctrine.

The next step is to examine the application of joint and service doctrine that is supporting the CENTCOM theater of operations. OEF began in November 2001 and OIF began in March 2003. Both conflicts have provided an opportunity for the military to exercise space operations doctrine. In October 2005, USSTRATCOM initiated a study to examine the space coordination process that existed in the CENTCOM theater of operations. The Joint Space Coordination Task Final Report, published in February 2006, provided an excellent snapshot

of the most current space capability coordination processes. This report, prepared by Mr. Randy Hugenroth of Booz Allen Hamilton, outlined the basic architectures for space coordination that exist among the COCOMs, identified shortfalls of the various architectures, and provided some recommendations for ways to improve the current coordination relationships. Reviewing the theater space coordination process currently implemented in the CENTCOM AOR allows for a simple transition into the next step in the process. Like all developing concepts, the current space coordination architecture in CENTCOM is not perfect and has room for improvement. While it is effective, it is certainly not optimized.

The JSCT Report did identify that not all the services agree with the way that the concepts of SCA and the DIRSPACEFOR have been implemented. For example, one of the conclusions of the JSCT Report pointed out that “the DIRSPACEFOR is solely an Air Force construct which should grow into the joint arena.”<sup>3</sup> The problem is not so much that the Air Force created the DIRSPACEFOR, but rather that current joint doctrine does not provide for such a position anywhere in the Joint Force Commander’s (JFC) organization. Also, “the appointment of the commander exercising SCA (space coordinating authority) needs to be refined and detailed in joint doctrine. Current practices vary from the JFC retaining SCA to the SCA being informally executed by headquarters staff elements.” Air Force doctrine highly recommends that the COCOM delegate SCA to the air component commander.<sup>4</sup> The other services, specifically the Army, are not in complete agreement that this is the correct solution. Army doctrinal developments indicate that the air component commander might not be the best choice for the delegation of Space Coordinating Authority.<sup>5</sup> This dynamic between the services shows that differing views exist and that a simple solution probably does not exist.

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<sup>3</sup> Randy Hugenroth, “Joint Space Coordination Task Final Report,” (Omaha, NE: Booz Allen Hamilton, 28 Feb 2006): 2.

<sup>4</sup> Air Force Doctrine Document 2: Operations and Organization. 62.

<sup>5</sup> Army Theater Space Support in Joint Operations – Today, 4.

The third step is to examine the varying near-term proposals for enhancing or changing the current theater space coordination process, as well as programs which might drive future change in the status quo. For instance, the Navy has initiated the Naval Space Campaign, which has as its operational goal to ensure that a deployed carrier strike group is fully integrated into the theater space coordination process, which the Navy discovered was not the case in the past. Another example of a near-term proposal for theater space coordination is the Army Theater Space Support Concept. This Army plan intends on integrating space expertise throughout the joint force land component in order to fully integrate space capabilities across multiple echelons, including tactical formations. Examining these service specific proposals will create a better understanding of the direction the military intends to go in its ongoing development of theater space coordination.

The final step is to examine various architecture solutions for theater space coordination. The first solution is to simply maintain the status quo. The second possible solution is the establishment of a Joint Functional Space Component Command within the regional combatant commander's organization. The third solution is the establishment of a theater space coordination cell that is part of the Joint Force Commander's staff. Through examining the positive and negative aspects of these solutions, one can identify the strengths and weaknesses of each and determine which should be the preferred solution.

Since the first Gulf War in 1990-91, warfighters have begun to make more and more requests for support from the space asset infrastructure. Whether for more SATCOM bandwidth, more ISR products, or more enhanced GPS accuracy, the requirements that the warfighters have placed on the space assets have increased to a point that the military is creating new terms, doctrine, and organizations to meet the required increased demand. The intent of these newly created constructs is to provide a mechanism for conducting the necessary coordination activities to ensure that all warfighter requirements are met by the space assets that provide them.

The lack of a joint vision for theater space coordination is detrimental to the long term development of each of the services' particular programs. The collective military space community cannot afford to waste its limited time and resources by failing to work together towards achieving the optimal solution for theater space coordination. Ultimately, a future path for the development of theater space coordination will appear in the next few years. How the military as a whole decides what that future path looks like is uncertain. At some point, the services will have to agree on the appropriate organization and doctrine that is necessary to meet the space needs of the warfighter.

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## **II. SIGNIFICANT DEFINITIONS**

As joint and service doctrine develops, it is often the case that individual concepts are interpreted or developed in a service-specific manner, resulting in diverging interpretations of a single theme. In order to properly bound the discussion ahead, concrete and common definitions must be laid out. The priority for these definitions is given first to joint doctrine publications (such as Joint Publication 1-02), then to service doctrines (such as Air Force Doctrine Document 2-2), then to other authoritative publications or reports. In some cases, official doctrine has not yet codified the organization or concept under discussion. In those cases, the most current information was used to develop the definition.

The chapter is broken down into two major sections: Organizations and Concepts. The first section outlines the organizations which play a key role in the space coordination process, while the second section defines doctrinal or operational concepts.

The definitions presented in this chapter summarize the key points of each organization or concept; for further detail, refer to the appendix.

### **A. ORGANIZATIONS**

#### **1. Joint Functional Component Command, Space and Global Strike**

On October 1, 2002, USSTRATCOM and U.S. Space Command merged to form a new unified command. On Jan. 10, 2003, Change Two to the Unified Command plan assigned USSTRATCOM four major tasks which had been unassigned to a specific unified command. In response to the merger with U.S. Space Command and the acceptance of new tasks, USSTRATCOM reorganized into four Joint Functional Component Commands and two functional components.<sup>6</sup>

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<sup>6</sup> U.S. Strategic Command, "U.S. Strategic Command History," <http://www.stratcom.mil/about-ch.html>, accessed May 2006.

The Commander, 8<sup>th</sup> Air Force was assigned as the Joint Functional Component Command, Space and Global Strike (JFCC SGS) in January 2005. The JFCC SGS is “responsible for integrating planning and command and control support for the rapid delivery of extended range, precision effects in support of theater or national objectives. [JFCC SGS] Also directs the deliberate planning and execution of assigned space operation missions.”<sup>7</sup>

In July 2006, Commander USSTRATCOM signed an implementation directive disestablishing JFCC Space and Global Strike, and establishing the Joint Functional Component Command for Space (JFCC SPACE).<sup>8</sup> The Commander, 14<sup>th</sup> AF will be the commander of this new organization.<sup>9</sup> The JFCC SPACE is scheduled to achieve IOC on 01 August 2006, with FOC in June 2007, and will execute all space roles and responsibilities previously assigned to JFCC SGS.<sup>10</sup>

## **2. Theater Air Control System**

The Theater Air Control System (TACS) is the mechanism for commanding and controlling theater air and space power. It consists of airborne and ground elements to conduct tailored C2 of air and space operations throughout the spectrum of conflict...As an organic US Air Force weapon system, the TACS remains under OPCON of the COMAFFOR.<sup>11</sup>

The Theater Air Control System consists of multiple elements; its key command and control portion is the Air and Space Operations Center, described in the following section.

## **3. Air and Space Operations Center (AOC)**

The AOC is the senior C2 element of the TACS and includes personnel and equipment of the necessary disciplines to ensure the effective conduct of air and space operations (e.g.,

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<sup>7</sup> U.S. Strategic Command, “Joint Functional Component Command for Space and Global Strike (JFCC SGS)”, [http://www.stratcom.mil/fact\\_sheets/fact\\_sgs.html](http://www.stratcom.mil/fact_sheets/fact_sgs.html), accessed May 2006.

<sup>8</sup> General James E. Cartwright, USMC, memorandum, 19 July 2006, Joint Functional Component Command for Space – Implementation Directive.

<sup>9</sup> General James E. Cartwright, USMC, memorandum, 19 July 2006, *Appointment to Command: Joint Functional Component Command for Space (JFCC SPACE)*.

<sup>10</sup> General James E. Cartwright, USMC, memorandum, 19 July 2006, Joint Functional Component Command for Space – Implementation Directive.

<sup>11</sup> Air Force Doctrine Document 2, Operations and Organization. 63.

communications, operations, intelligence, etc.). As the operations command center of the JFACC, it provides the capability to plan, task, execute, monitor, and assess the activities of assigned or attached forces.<sup>12</sup>

#### **4. FALCONER Air Operations Center**

The Falconer AOC is essentially an AOC which has been tailored to the needs of a specific theater or combatant commander. It serves as the primary C2 element for the JFACC, as does the baseline AOC. The significance of the Falconer AOC is that it can be shaped and scaled to meet specific needs, from a combatant commander level down to a sub-unified commander or joint task force. The deployment or employment of its individual elements is based on customer need rather than inflexible organizational definition.<sup>13</sup>

#### **5. Joint Space Operations Center (JSpOC)**

The JSpOC is the operational command and control (C2) center that provides Commander, JFCC SGS (CDR JFCC SGS), via the Commander, Joint Space Operations (CDRJSO), the capability to plan, task, direct, synchronize, and assess the activities of assigned and attached space forces (as well as those space forces made available for tasking)... CDR JFCC SGS executes OPCON of space forces via the JSpOC at Vandenberg AFB, CA.<sup>14</sup>

As a Falconer AOC, the JSpOC has a very similar structure to a CFACC AOC. It lacks a mobility division, and adds divisions specific to space functions (assured access, for example). As an AOC, the JSpOC is charged with conducting both future planning and current operations. Its Strategy Division conducts the planning function, while the Combat Operations Division develops and executes the Space Tasking Order (S-T-O). The S-T-O, similar to an Air Tasking Order (ATO), tasks space forces over which the JSpOC has been assigned operational or tactical control.

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<sup>12</sup> Air Force Doctrine Document 2, Operations and Organization. 54.

<sup>13</sup> Air Force Doctrine Document 2, Operations and Organization. 94.

<sup>14</sup> Air Force Operational Tactics, Techniques, and Procedures 2-3.4, Joint Space Operations Center (Draft), 20 January 2006.



## **6. Standing Joint Force Headquarters (SJFHQ)**

During Exercise Millennium Challenge '02, Joint Forces Command (JFCOM) developed and tested the concept of the Standing Joint Force Headquarters (SJFHQ). This is a full-time construct within a unified commander's staff which is charged with the readiness to stand up as a Joint Task Force headquarters on short notice. The concept is designed to prevent a staff which has never planned or operated together from being hastily assembled in a crisis situation. Instead, the SJFHQ staff, comprised of smaller elements from each of the regional service component commanders, is always constituted and regularly exercises its functions.

The Secretary of Defense has mandated that all unified commanders adopt the SJFHQ within their organizations; the specific form of implementation, however, has been left up to each commander to tailor to theater-specific needs. The individual services are restructuring their theater-level command and control organizations to align with the SJFHQ. The U.S. Navy's Maritime Headquarters and the U.S. Air Force's War Fighting Headquarters are examples of this process.<sup>15</sup>

## **7. War Fighting Headquarters (WFHQ)**

The US Air Force is establishing a new operational-level warfighting headquarters (WFHQs) to serve as the core of the US Air Force Service component headquarters to the respective unified combatant commands. These new WFHQs will assume many of the operational responsibilities of today's MAJCOMs and NAFs. Each of these WFHQs will consist of a commander, an AOC, and an AFFOR staff, all appropriately tailored to support their combatant commander. The WFHQ commander...should also be prepared to assume responsibilities as the C/JFACC.<sup>16</sup>

## **8. Maritime Headquarters with Maritime Operations Center (MHQ-MOC)**

The Navy's contribution to the SJFHQ is the Maritime Headquarters with Maritime Operations Center (MHQ-MOC). This organization is designed to

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<sup>15</sup> U.S. Joint Forces Command, "Pamphlet 3 – Doctrinal Implications of the Standing Joint Force Headquarters (SJFHQ)," 1. [http://www.dtic.mil/doctrine/jel/other\\_pubs/jwfc pam3.pdf](http://www.dtic.mil/doctrine/jel/other_pubs/jwfc pam3.pdf). Accessed May 2006.

<sup>16</sup> Air Force Doctrine Document 2, Operations and Organization. 41.

parallel the Air Force WFHQ/AOC described above. The development of the Maritime Headquarters architecture is still very much in the embryonic stages, and has not yet appeared in official doctrine.

In CNO Guidance for 2006: Meeting the Challenge of a New Era, Admiral Michael Mullen outlines several steps that the Navy-Marine Corps team will take in order to increase contributions to the joint force. The first item listed reads: “Establish and enable Globally Networked Joint Force Maritime Component Commanders (JFMCCs), leveraging deployed forces to provide access, dominance, persistence and shaping – to include capturing C2 relationships with assigned intelligence assets within and between JFMCC’s.”<sup>17</sup> Responsibility for the development of these JFMCCs was assigned to Commander, Fleet Forces Command in Norfolk, VA. Commander, Second Fleet was delegated developmental responsibility for the JFMCC concept. The MHQ-MOC is designed to be the fulfillment of the globally-networked JFMCC concept.

#### **9. Network, Information Operations, and Space Center Space Cell**

Headquartered at Little Creek Naval Amphibious Base, Virginia, the Naval Network Warfare Command is the Navy’s type commander (TYCOM) for all space assets. This command also has responsibility for network and information operations. NETWARCOM’s command center is known as the Network, Information Operations, and Space Center (NIOSC).

Within the NIOSC is the Space Cell, responsible for providing reachback support for deployed naval units and theater JFMCC’s. The mission of the NIOSC Space Cell is to interface between the joint space arena and the maritime customer, translating maritime requirements into joint terms, and providing support specific to maritime operations. The Space Cell is essentially an extension of the JFMCC or afloat commander’s staff, one with a combination of maritime and space expertise.<sup>18</sup>

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<sup>17</sup> Admiral Michael Mullen, USN, “CNO Guidance for 2006”, 7. <http://www.navy.mil/features/2006CNOG.pdf>. Accessed May 2006.

<sup>18</sup> Naval Network Warfare Command, “NIOSC Space Cell,” (brief, Norfolk, VA, 24 Apr 2006).

## **10. Director of Space Forces (DIRSPACEFOR)**

The Director of Space Forces is a U.S. Air Force officer, normally an O-6, who is a member of the COMAFFOR/CFACC Commander's staff. Normally, the COMAFFOR/CFACC will have been designated as Space Coordinating Authority by the JFC, and the DIRSPACEFOR will execute that authority on behalf of the CFACC. The DIRSPACEFOR operates primarily in a planning and deconfliction role. He has the necessary knowledge to provide space-related input to theater planning processes, and the reachback capability to integrate the entirety of national security space assets in support of theater operations.

Although the DIRSPACEFOR coordinates with and provides support to the other service component commanders (in effect making it a joint position), the actual billet is provided from the U.S. Air Force Space Command, thus dictating that the position be filled only by Air Force personnel and be assigned no higher than the COMAFFOR staff.<sup>19</sup>

## **11. Army Space Support Team**

The ARSSTs are USASMDC assets from the Active Army, USAR and ARNG. ARSSTs rapidly deploy worldwide within 48 hours to augment corps and division space expertise, normally within the G3 section, during exercises and contingency operations, including combat operations. Their primary support is at the operational and tactical levels. ARSSTs may be assigned to support other levels in Army or non-Army units.<sup>20</sup>

## **12. Space Support Element**

While the ARSST is a non-organic space support asset for Army forces, the Space Support Element (SSE) is organic to Army tactical headquarters, normally the division or joint task force level. An SSE normally consists of two Functional Area 40 (FA 40) Space Operations Officers. The SSE provides space support both to its headquarters unit and subordinate units as required. If necessary, the SSE can be augmented by an ARSST.<sup>21</sup>

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<sup>19</sup> Air Force Doctrine Document 2, Operations and Organization. 57.

<sup>20</sup> Field Manual 3-14: Space Support to Army Operations. C-1.

<sup>21</sup> Ibid, E-1

## **B. CONCEPTS**

### **1. Coordinating Authority**

Coordinating Authority is defined as:

A commander or individual assigned responsibility for coordinating specific functions or activities involving forces of two or more Military Departments, two or more joint force components, or two or more forces of the same Service. The commander or individual has the authority to require consultation between the agencies involved, but does not have the authority to compel agreement.<sup>22</sup>

### **2. Space Authority**

To facilitate unity of the theater/joint operations area (JOA) space effort, the supported combatant commander or a joint force commander (JFC) may designate a space authority. The space authority will coordinate space operations, integrate space capabilities, and have primary responsibility for in-theater joint space operations planning...the space authority designated by the JFC will coordinate space support of established objectives and act on behalf of the combatant commander with primary responsibility in theater for joint space operations planning.<sup>23</sup>

### **3. Space Coordinating Authority (SCA)**

Air Force Doctrine Document (AFDD) 2, combines the joint terms “coordinating authority” and “space authority” as “space coordinating authority.” AFDD 2 provides finer granularity of detail regarding the roles and responsibilities of the SCA, and outlines the logic for assignment of SCA to the CFACC.<sup>24</sup>

### **4. Joint Warfighting Space**

The concept aims to provide operationally responsive access to and the tactical exploitation of space/near-space. The JWS concept is best characterized as a responsive, end-to-end networked set of space/near-space capabilities dedicated to the JFC and integrated with NSS systems. The JWS concept calls for the deployment of expeditionary space forces that deliver responsive space capabilities to the JFC to achieve operational and tactical effects in support of assigned missions.<sup>25</sup>

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<sup>22</sup> Joint Publication 0-2, Unified Action Armed Forces (UNAAF). GL-6.

<sup>23</sup> Joint Publication 3-14: Joint Doctrine for Space Operations. ix.

<sup>24</sup> Air Force Doctrine Document 2, Operations and Organization. 56.

<sup>25</sup> U.S. Air Force, “Operating Concept for Joint Warfighting Space (Draft),” 13 Jan 2005, 9.

Joint Warfighting Space will require a different command and control paradigm than that currently exercised for space forces. Rather than being centrally controlled by an organization such as JFCC SPACE, forces which are developed under the JWS concept are intended to be under the direct control of the Joint Force Commander (JFC).<sup>26</sup>

## **5. Space Effects**

The term “space effects,” sometimes used to generically describe the various outputs of space mission areas, does not appear in joint literature. The word “effects” can lead to confusion, and as defined in Joint Publication (JP) 1-02 (Department of Defense Dictionary of Military and Associate Terms), does not communicate the concept correctly. Instead, we will use the terms “space force application” and “space force enhancement” as defined in JP 1-02 to describe the space mission area outputs which are used by the warfighter.

a. Effect: A change to a condition, behavior, or degree of freedom.<sup>27</sup>

b. Space Force Application: Combat operations in, through, and from space to influence the course and outcome of conflict. The space force application mission area includes ballistic missile defense and force projection.<sup>28</sup>

c. Space Force Enhancement: Combat support operations to improve the effectiveness of military forces as well as support other intelligence, civil, and commercial users. The space force enhancement mission area includes: intelligence, surveillance, and reconnaissance; integrated tactical warning and attack assessment; command, control, and communications; position, velocity, time, and navigation; and environmental monitoring.<sup>29</sup>

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<sup>26</sup> U.S. Air Force, “Operating Concept for Joint Warfighting Space (Draft),” 13 Jan 2005, 4.

<sup>27</sup> Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms. 176.

<sup>28</sup> Ibid., 493.

<sup>29</sup> Ibid., 493.

### **III. JOINT SPACE COORDINATION TASK**

In the fall of 2005, USSTRATCOM initiated a project titled the Joint Space Coordination Task (JSCT). This project was designed to research three specific theater space command and control issues. The JSCT was to first, “conduct analysis to determine the current coordination process (in theater) for the DIRSPACEFOR in support of CDR USCENTCOM”; second, “identify DIRSPACEFOR requirements of all other Regional and Functional Combatant Commanders”; and third, “identify the GSCA’s roles, responsibilities, and relationship with the theater DIRSPACEFOR.” This project took approximately 6 months and provided specific feedback and recommendations for improving theater space coordination.<sup>30</sup>

#### **A. MILITARY SPACE COMMAND AND CONTROL ORGANIZATION**

In order to understand the roles of the concept of SCA and the position of DIRSPACEFOR, it is important to review the overarching military space C2 architecture. First, USSTRATCOM is responsible for ensuring that the United States can perform the four doctrinal space mission areas of space support, space force enhancement, space control, and space force application. Through JFCC SPACE, USSTRATCOM “integrates all elements of military power to conduct, plan, and present global strike effects and also direct the deliberate planning and execution of assigned space operation missions.”<sup>31</sup> STRATCOM has assigned Global Space Coordinating Authority (GSCA) to JFCC SPACE. The Joint Space Operations Center (JSpOC) is the central node for the command and control of all DoD space forces. At a peer level with USSTRATCOM are the other geographic Combatant Commands (COCOMs). Each COCOM utilizes a somewhat different construct for coordinating required

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<sup>30</sup> Randy Hugenroth, “Joint Space Coordination Task Final Report,” (Omaha, NE: Booz Allen Hamilton, 28 Feb 2006): 2.

<sup>31</sup> U.S. Strategic Command, “Functional Components,” [http://www.stratcom.mil/organization-fnc\\_comp.html](http://www.stratcom.mil/organization-fnc_comp.html). Accessed May 2006.

space support.<sup>32</sup> The CENTCOM organization is detailed in this chapter; Chapter IV outlines the remainder of the COCOM structures.

## **B. CENTCOM SPACE COORDINATION CONSTRUCT**

The JSCT reviewed the details of the CENTCOM DIRSPACEFOR construct in order to provide recommendations for future theater space coordination developments. As discussed in Chapter II, the DIRSPACEFOR serves as the senior space officer to the CFACC. However, when the Air Force created the DIRSPACEFOR position, it did so outside of joint doctrine. Therefore, the CENTCOM DIRSPACEFOR does not serve in a joint billet. The Air Force, through Air Force Space Command (AFSPC), nominates officers to serve as the CENTCOM DIRSPACEFOR. The current AFSPC policy is to nominate a sitting Operations Group or Wing Commander to the position of DIRSPACEFOR. The theater CFACC reviews and approves the nominations. The DIRSPACEFOR serves a 4-month tour at the CFACC, while an Army space operations officer serves a 12-month tour as the Deputy DIRSPACEFOR.<sup>33</sup>

Although the position is not on the Joint Force Commander's (JFC) staff, the DIRSPACEFOR effectively serves as the senior space officer in the entire CENTCOM AOR. The CENTCOM Commander has delegated space coordinating authority to the CFACC. The DIRSPACEFOR serves on the CFACC's special staff and advises the CFACC on theater space capabilities and coordination. The DIRSPACEFOR coordinates with the CAOC to provide the CFACC and the JFC with a central space coordination point for all functional components within the theater. Ground elements with SSEs or ARSSTs may conduct direct coordination with the DIRSPACEFOR and the CAOC. The DIRSPACEFOR and CAOC are able to reach back primarily with the JSpOC, but also with other National Security Space agencies, depending on the required support.<sup>34</sup>

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<sup>32</sup> Hugenroth, 7-9.

<sup>33</sup> Ibid, 6-7.

<sup>34</sup> Ibid., 4.

### **C. CENTCOM SPACE COORDINATION PROCESS**

The CENTCOM DIRSPACEFOR and CFACC issued a formal Space Coordination Plan (SCP) in January 2006. This plan provides a four step process for ensuring that all available space capabilities are used effectively during theater operations. The first step is called the Initial Planning Phase, during which any CJTF or component planning staff within CENTCOM that is planning a major named operation may initiate a dialogue with the CAOC Strategy Division. If the operation requires space capabilities to achieve the desired effect, then the CAOC Strategy Division begins coordinating with the DIRSPACEFOR to initiate reachback planning. The second step is the Reachback Planning Cycle that allows the DIRSPACEFOR to coordinate with all appropriate National Security Space agencies that provide capabilities which could enhance the planned operation. The third step is the CJTF/Component Commander Review, which gives the supported commander the chance to review and concur or non-concur with the recommended space support. Once the supported commander concurs, then the process generates a formal request to the CFACC for coordination, approval, and execution.<sup>35</sup>

This entire process could take from a few hours to a week or more, depending on the type of space support which was requested. The SCP also uses an official Space Support Request (SSR) form which allows the CAOC and the DIRSPACEFOR to tracking the space coordination process. Space Support Requests are tracked by the CAOC Combat Operations Division.<sup>36</sup>

### **D. JSCT CONCLUSIONS**

The JSCT finalized its report in February 2006 and presented several bottom line conclusions. These discussed the various positive and negative aspects of the SCA terminology, the DIRSPACEFOR position, and recommended initiating for the rewrite of Joint Publication 3-14 as soon as possible.<sup>37</sup>

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<sup>35</sup> Hugenroth, 5-6.

<sup>36</sup> Ibid, 6.

<sup>37</sup> Ibid., 2.



Space Coordinating Authority is not a term found in joint doctrine. The JSCT found that the absence of an overall definition for this and other terms has created some confusion within the joint space community. Despite proposals to eliminate this terminology, SCA and GSCA continue to be refined by USSTRATCOM and the Air Force. The JSCT recommended that the terminology be included in future joint publications once the joint space community has had a chance to more fully develop the concept.<sup>38</sup>

With respect to the DIRSPACEFOR, the JSCT recommends that this position be developed in future joint doctrine and be renamed as the “Joint Space Coordination Officer.” The basic issue for the JSCT was the fact that the DIRSPACEFOR is solely an Air Force construct and is not fully understood by most within the joint space community.<sup>39</sup>

The fact that AFSPC nominates the DIRSPACEFOR from its pool of O-6 Wing or Group commanders was determined to be a point of contention with other services. One concern stems from the fact that the current process excludes senior “space smart” officers from other services, since only Air Force officers can fill an Air Force-generated billet. Another concern has to do with selection source and tour length of the DIRSPACEFOR. The intent of the DIRSPACEFOR position is not only to provide a senior “space smart” officer but also one who has theater expertise. However, the Air Force chooses its DIRSPACEFORs from a pool of Wing or Group commanders that may or may not have any relationship to the CENTCOM theater. Also, the Air Force deploys each DIRSPACEFOR for approximately 120 days, which limits the amount of theater expertise a DIRSPACEFOR can gain once in theater.<sup>40</sup>

The JSCT recommended that the development of the “Joint Space Coordination Officer” would help mitigate the exclusion of senior space officers from other services. Also, the JSCT highly recommended that the Air Force

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<sup>38</sup> Hugenroth, 2.

<sup>39</sup> Ibid.

<sup>40</sup> Ibid.

extend the tour of its DIRSPACEFOR officers. It recommended that the theater's senior space officer should serve for at least a year, three times as long as DIRSPACEFOR's currently serve.<sup>41</sup>

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<sup>41</sup> Hugenroth, 2.

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## **IV. ANALYSIS OF THE CURRENT CENTCOM CONSTRUCT**

### **A. HISTORY OF THE CENTCOM DIRSPACEFOR POSITION**

Although the 1991 Gulf War is often referred to as the first space war, increasing utilization of space support and force enhancement did not imply commensurate sophistication in the intra- and inter-theater coordination of that support. For the next 10 years, space coordination was largely an ad hoc construct depending in part on educated officers and fortuitous personal relationships at the various commands which provided space support and force enhancement.<sup>42</sup>

In November 2002, the CAOC team which was to execute Operation IRAQI FREEDOM (OIF) conducted Exercise Internal Look 2002.<sup>43</sup> During this exercise the position of Senior Space Officer (SSO) (which would eventually be renamed the Director of Space Forces) began to be outlined, as that role did not exist in current Air Force CONOPS.<sup>44</sup> Prior to the actual commencement of OIF, the SSO and his support team focused on the development of command relationships within the CENTCOM AOR. These relationships were understandably fragmented, as the SSO was a new concept undergoing operational testing in a real-world situation. Immediately prior to the start of OIF, CENTCOM designated the CFACC as the Space Coordinating Authority (SCA) for the theater, in order to manage the volume of support requests being sent to the 14<sup>th</sup> Air Force's Joint Space Operations Center (JSOC) by individual service components.<sup>45</sup>[3] Two other concerns the SSO team began to address were "ensuring missile warning capabilities and addressing potential Iraqi Global Positioning System (GPS) jamming capabilities."<sup>46</sup> The SSO team provided a

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<sup>42</sup> Lt Gen Frank G. Klotz, USAF. "Space Command and Control: The Lynchpin to Our Success," *High Frontier* 2 no. 3 (2006):2.

<sup>43</sup> Brig Gen Larry D. James, USAF. "Bringing Space to the Fight: The Senior Space Officer in Operation IRAQI FREEDOM," *High Frontier* 1 no. 4 (2005):14.

<sup>44</sup> Ibid.

<sup>45</sup> Ibid,

<sup>46</sup> Ibid,

valuable synergizing effect in the areas of space support and force enhancement, specifically missile warning, GPS accuracy prediction, and GPS jamming mitigation.

During the three years since its inception, the DIRSPACEFOR concept has undergone continuous refinement. Each officer assigned the role has added personal expertise and vision, and has built upon the efforts of previous DIRSPACEFORs. A theater Space Coordination Plan is in place, approved by CENTCOM, and best practices are beginning to be captured in theater and service policy. This construct is clearly fulfilling the primary responsibilities which have been assigned to it. However, it has not been analyzed in detail to determine whether it is an efficient, and not simply effective, construct. Additionally, the space coordination construct being applied in CENTCOM is not a product of joint doctrine, and therefore is not required to be applied uniformly in all theaters.

## **B. POSITIVE ASPECTS OF THE CENTOM CONSTRUCT**

### **1. Space Expertise**

The addition of a dedicated senior officer on the CFACC staff provides a level of space expertise not previously available in theater. While the CAOC divisions have Space Weapons Officers assigned, and there is a company-grade (O-3) space officer at the CENTCOM headquarters in Qatar, the DIRSPACEFOR brings an entire career of space experience and connections to the CFACC. It is highly likely that an officer assigned to this position will have attended both junior and senior level professional schools (ACSC, SASS, or another service equivalent) and so will have an understanding of joint warfare concepts. As the DIRSPACEFOR and his support personnel interact with the theater operational planning and execution process, the big-picture view of operations coupled with the understanding of how space support or force enhancement capabilities can be applied results in a synergy which effectively acts as a force multiplier for the theater commander.

## **2. Extensive Reachback**

As a sitting wing commander or operations group commander, the DIRSPACEFOR possesses extensive reachback capabilities. While each service primarily uses reachback to its own individual support structure (ARSST to SMDC-OC, CSG to NIOSC), the DIRSPACEFOR is able to reach back not just to the JSpOC but to the national security space organization as a whole. The DIRSPACEFOR is thus able to leverage a much broader range of systems and organizations than any individual service component.

## **C. NEGATIVE ASPECTS OF THE CENTCOM CONSTRUCT**

### **1. Service Centric**

The DIRSPACEFOR concept was created by the Air Force, not STRATCOM or a unified commander. While the initiative to create the position in support of Operation Iraqi Freedom was correct and proper at the time, the service-specific nature of the concept has become a detriment. Right or wrong, the other services view the creation of a uniquely Air Force position responsible for all space coordination in a theater as an exclusionary extension of the Air Force's influence. The fact that it is an Air Force-provided billet excludes even well-qualified senior space cadre from other services from filling the position. This induces resentment (however unjustified) rather than support among the other services, and in fact does prevent the theater or CFACC from drawing on additional space expertise among the other services' space cadre.<sup>47</sup>

### **2. Theater "Outsider"**

Since the DIRSPACEFOR is drawn from a CONUS-based command, he is not an expert in the organization, culture, or operations of the theater to which he might be assigned. In addition, the tour length for a DIRSPACEFOR is only four months long. The combination of these two factors results in an extremely compressed timeline for the DIRSPACEFOR to arrive in theater, synchronize with theater operations, build relationships, and begin operating effectively. More serious than a degraded level of effectiveness is the fact that theater

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<sup>47</sup> Randy Hugenroth, "Joint Space Coordination Task Final Report," (Omaha, NE: Booz Allen Hamilton, 28 Feb 2006): 7.

commanders are reluctant to accept onto their key staff someone who is unfamiliar with the particulars of their particular area of operations.<sup>48</sup>

### **3. Incomplete Definition**

The roles and responsibilities of the DIRSPACEFOR, along with the nature of the Space Coordinating Authority which he executes, are not yet well-defined. Best practices are being developed at the tactical and operational levels in CENTCOM and other theaters, and are just now beginning to appear in doctrine documents such as AFDD 2. This is largely a result of the still-immature nature of the DIRSPACEFOR concept; unfortunately, the fact remains that in many ways the DIRSPACEFOR team is exploring its battlespace rather than executing a well-established set of tasks.

### **4. Wrong Level of Warfare**

A case can be made that the DIRSPACEFOR (or more specifically, SCA) has been placed at the wrong level of warfare.<sup>49</sup> It is believed that this coordinating authority, given its joint scope, ought to be assigned to the combatant commander's direct staff, rather than that of the CFACC. As a member of the JFC's staff, the position executing SCA would have greater visibility over a wide range of theater operations, and more influence with the command authorities who could drive the coordination which today the SCA can only recommend.

## **D. COMPARISON WITH OTHER THEATERS**

The JSCT report outlines the ways in which the SCA concept is being applied at the other COCOMs, and reveals that there are as many ways to conduct theater space coordination as there are theaters to coordinate. This disparity among the different theaters arises from several different reasons, all of which address valid concerns. However, the net result is that there is no standard space coordination construct which is globally applicable and easily understood by any user entering a particular theater. The following section outlines the JSCT report's findings in each theater.

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<sup>48</sup> Hugenroth, 7.

<sup>49</sup> Ibid., 2.

## **1. USPACOM**

In the PACOM AOR, SCA is delegated to the JFACC. This is also the case with USFK (although in Korea the JFACC is designated as a CFACC). In both cases, the JFACC utilizes an officer designated as the DIRSPACEFOR to execute SCA, a position which is only active during exercises such as TERMINAL FURY or ULCHI FOCUS LENS. For USFK, the title of the DIRSPACEFOR becomes the Space Coordinating Officer if conducting joint operations.<sup>50</sup> (Note: The Space Coordinating Officer terminology is not found in any service or joint publication.)

Should a situation arise in PACOM similar to that in CENTCOM, where daily combat operations are being conducted, it is reasonable to assume that the DIRSPACEFOR position would be activated and utilized in much the same manner as is currently the case in CENTCOM.

## **2. USEUCOM**

SCA has not been delegated in the EUCOM AOR, and is normally exercised by the Chief, Space Operations Branch. Should the AOR transition to a JTF, it is expected that SCA would be delegated to the JFACC. In all likelihood, the JFACC would be a Navy staff embarked onboard USS MOUNT WHITNEY (LCC-20), the command ship for Commander, SIXTH FLEET. The construct of a DIRSPACEFOR deployed from CONUS is not favored in EUCOM due to a lack of theater-specific background and joint perspective.<sup>51</sup>

If a situation requiring the formation of a JTF occurred in EUCOM, the staff position which executed SCA would most likely be chosen from within the theater, and would be a direct representative from the COCOM to the JFACC staff within the JTF. It is important to note that the actual officer executing SCA would probably be a Navy, rather than Air Force, officer.

## **3. USNORTHCOM**

SCA within NORTHCOM is currently retained at the COCOM level and has not been delegated lower. The Air Force deployed an officer with JTF

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<sup>50</sup> Hugenroth, 8.

<sup>51</sup> Ibid.



KATRINA to act as DIRSPACEFOR, but that position was not executing SCA for NORTHCOM, nor acting in a joint capacity.<sup>52</sup>

#### **4. USSOUTHCOM**

SOUTHCOM's SCA role is carried out by their J-3. This has not been formally delegated to him but is done by default. SOUTHCOM noted they have very few space issues, and as a result it is on the back burner for them. They do not use a DIRSPACEFOR and one is not provided for them.<sup>53</sup>

#### **5. USSOCOM**

SOCOM has designated their space branch to execute SCA responsibilities. He would be the senior space officer for the JTF and assumes the SCA for the SOCOM JTF when stood up. They also do not have a DIRSPACEFOR.<sup>54</sup>

### **E. CONCLUDING COMMENTS**

Although the DIRSPACEFOR concept was introduced over three years ago, it is still an immature construct due to the complexity of its roles and wide scope of employment. A concept which must consider the needs of six unified commanders, leverage a broad spectrum of assets, support dynamic wartime operations in one theater, and cope with rapidly changing organizational constructs will not develop quickly. One thing is clear – the Air Force's development of the DIRSPACEFOR concept was timely and relevant to current operations. The concept is flawed, but not fatally so. A few "tweaks" and adjustments, relatively minor in the grand scheme of military operations, will succeed in more closely aligning it to theater needs and including other services in its execution.

Of all the unified commanders, PACOM has an overall construct which appears to most closely mirror that currently in place in CENTCOM. This may be due to the relatively high pace of activity in PACOM and the higher possibility of combat action there relative to other theaters. The fact that each theater has a markedly different way of doing business, one that is often not exercised under

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<sup>52</sup> Hugenroth, 9.

<sup>53</sup> Ibid.

<sup>54</sup> Ibid.

strenuous conditions, is a detriment to the global standardization necessary for today's military forces to effectively operate in any theater, regardless of their home base. While no "one size fits all" construct can be found, a baseline template which can be applied to all unified commands and modified as necessary to meet specific AOR needs must be developed in order to prevent a steep learning curve during combat operations, when the price of learning new lessons is often the lives of Americans.

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## V. SERVICE COMPONENT ARCHITECTURES

### A. U.S. NAVY ORGANIZATION

#### 1. Naval Space Campaign

Beginning in 2001, both the Department of Defense (DoD) and the Navy made significant changes in the organization of their space components. The Secretary of Defense released a memorandum with the subject “National Security Space Management and Organization” in October 2001. Among other things, this memorandum directed the services to establish and develop a cadre of space professionals to execute the national security space mission.<sup>55</sup> The Navy stood up Commander, Naval Network Warfare Command (NNWC) in May 2002, simultaneously renaming Naval Space Command as Naval Network and Space Operations Command (NNSOC), which became the operations (N-3) arm of NNWC.<sup>56</sup> In June 2003, DoD Directive 5101.2 designated the Air Force as the DoD Executive Agent for Space.<sup>57</sup> In response to these changes, the Naval Space Campaign began in the fall of 2004, with Commander, NETWARCOM, Commander, SECOND Fleet (C2F), and Commander, Carrier Strike Group EIGHT taking part.<sup>58</sup>

In the Chief of Naval Operations (CNO) Guidance for 2005, the conduct of a Naval space strategy and Campaign Plan was formally tasked to Commander, Fleet Forces Command (CFFC, now Commander, U.S. Fleet Forces Command).<sup>59</sup> Commander, NETWARCOM was tasked by CFFC as the lead agency for the Naval Space Campaign development.<sup>60</sup>

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<sup>55</sup> The Honorable Donald Rumsfeld, memorandum, 18 October 2001, *National Security Space Management and Organization*, 13.

<sup>56</sup> Naval Network Warfare Command, “Naval Network Warfare Command (COMNAVNETWARCOM), <https://ekm.netwarcom.navy.mil/netwarcom/nnwc-nipr/directory/about.htm>. Accessed June 2006.

<sup>57</sup> Department of Defense Directive 5101.2, “Executive Agent for Space,” 03 June 2003: 3. [http://www.dtic.mil/whs/directives/corres/pdf/d51012\\_060303/d51012p.pdf](http://www.dtic.mil/whs/directives/corres/pdf/d51012_060303/d51012p.pdf). Accessed June 2006.

<sup>58</sup> Naval Network Warfare Command, “Naval Space Campaign Plan”, 13 November 2005, 4.

<sup>59</sup> Admiral Vernon Clark, USN, “CNO Guidance for 2005”, 20. <http://www.chinfo.navy.mil/navpalib/cno/clark-guidance2005.pdf>. Accessed June 2006.

<sup>60</sup> Naval Network Warfare Command, “Naval Space Campaign Plan”, 13 Nov 2005, 7.

The Naval Space Campaign focuses on “delivering space capabilities to the warfighter to increase combat effectiveness.”<sup>61</sup> Commander, Carrier Strike Group EIGHT is Commander, SECOND FLEET’s Executive Agent for the execution of the first iteration of the campaign plan.<sup>62</sup> Through various training opportunities, the strike group senior leadership has been exposed to the capabilities of DoD and national space systems, and possible applications of those systems to maritime operations. As Carrier Strike Group EIGHT progresses through its training and deployment cycle, it will develop opportunities to apply space systems to maritime operations, and provide lessons-learned feedback to refine the space campaign. The overall goal is to be able to apply both the training and operational execution to follow-on strike groups Navy-wide.

## 2. Current Navy CSG-level Space Organization

At the tactical level, Commander, Carrier Strike Group EIGHT has established a space organization within his staff to execute day-to-day space planning and operations (Fig. 1). This organization is not comprised of additional billets provided to the staff, but instead takes personnel from within the staff and assigns them additional duties for space operations.

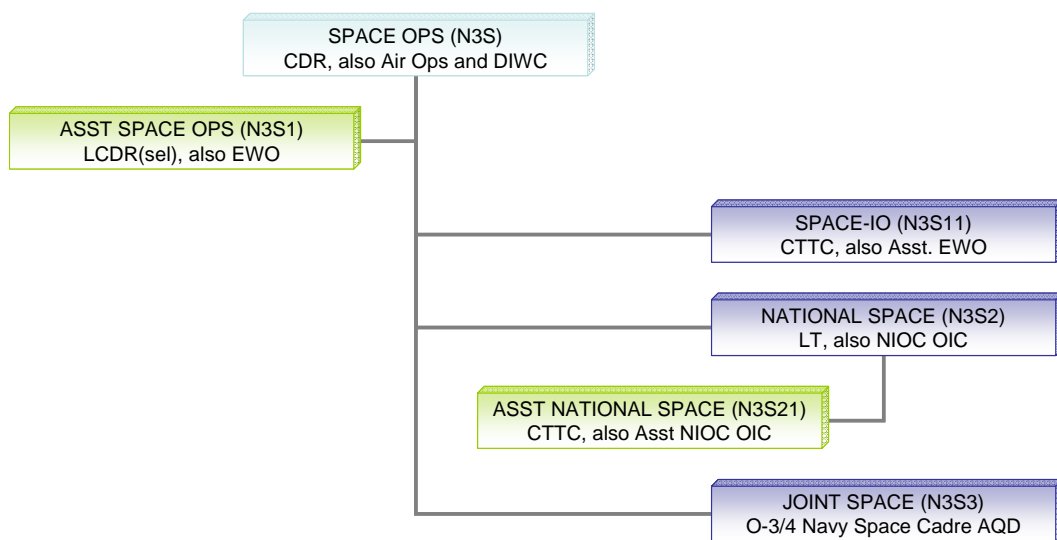


Figure 1. CSG-8 Space Organization<sup>63</sup>

<sup>61</sup> Ibid., 1.

<sup>62</sup> Ibid., 4.

<sup>63</sup> Commander Zigmond Leszczynski, USN, e-mail message to author, 14 Feb 2006.

The strike group space organization is able to reach back to the NIOSC Space Cell, which acts as a virtual staff for the strike group space operations officer. The NIOSC Space Cell provides the capability for in-depth research of specific areas, as well as reachback (or reach-out) to joint and national space organizations in support of maritime operations planning. If required, the JSpOC or the theater DIRSPACEFOR can provide additional reachback capabilities.

In preparation for deployment to the CENTCOM AOR, the strike group space operations officer has begun coordination with the CENTCOM CFMCC and DIRSPACEFOR to begin building the space coordination links which will be utilized once the strike group is in theater. The basic structure has the strike group space operations officer utilizing reachback to the NIOSC Space Cell for future planning, while working with the DIRSPACEFOR in order to provide required support to ongoing maritime operations. The DIRSPACEFOR, with his ability to interface with national systems, will be able to bring together the national products and maritime operators in a synthesized fashion which aims to provide significant enhancement to theater maritime operations.

Figure 2 represents the space coordination construct with which CSG-8 will deploy in the fall of 2006.

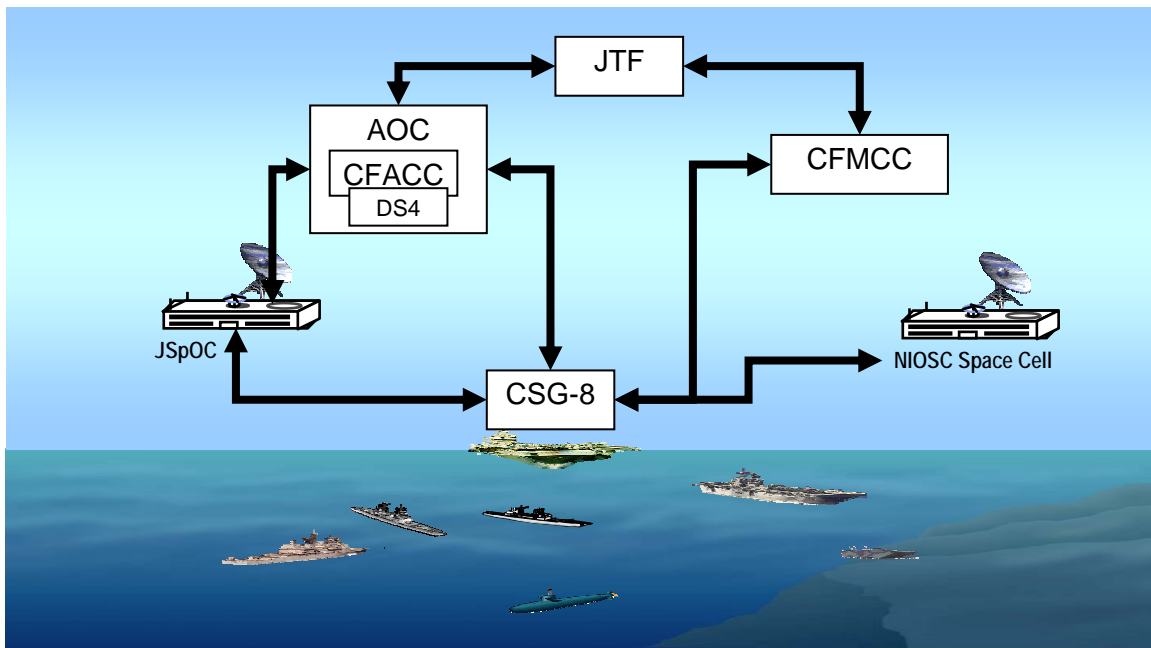


Figure 2. CSG-8 Current Space Coordination Construct<sup>64</sup>  
[From Naval Space Campaign Brief]

### 3. Future Theater and CSG-level Space Organization

The Navy is developing space coordination organizations at multiple levels. The CSG-level organization will undergo refinement as CSG-8 deploys and provides feedback to USFFC. However, it will most likely not change significantly in the near future. The continued focus at this level will be the integration of space support into the existing N-organizations (N2, N3, N6) in order to enhance their individual mission areas.

The space organization which will be a part of the MHQ is not yet well-developed. There is in fact a certain level of resistance to the inclusion of a space coordination cell within the MHQ structure, mostly due to the lack of widespread understanding of the ubiquitous nature of space support to maritime

<sup>64</sup> Naval Network Warfare Command, "Naval Space Campaign," (brief, Maritime Headquarters Operational Advisory Group, Norfolk, VA, 06 Jun 2006).

operations. While the exact nature of the space coordination cell within the MHQ will be developed separately, the existence of such a cell will be a key enabler as the MHQ executes its mission.

At each level of warfare, whether tactical, operational, or strategic, a space coordination cell of some type needs to be present in order to provide the synergizing effect that makes space capabilities a significant force multiplier. The space coordination cell will be able to combine organic expertise and dedicated reachback with visibility over the organization's plans and operations to ensure that the fullest integration of space capabilities takes place. Figure 3 represents the first step in the Navy space coordination construct of the future, while Figure 4 represents the desired end state with the MHQ/MOC fully realized. Key components of this construct are the interfaces between the theater and the deployed CSG. The presence of a space coordination cell at the MHQ-MOC provides the deployed CSG with a single point of contact for all of its space support and force enhancement requests. In addition, the space coordination cell at the MHQ-MOC will have visibility over the operations of all CSGs and CTFs operating within its AOR, and will be able to proactively integrate space capabilities across the spectrum of operations.



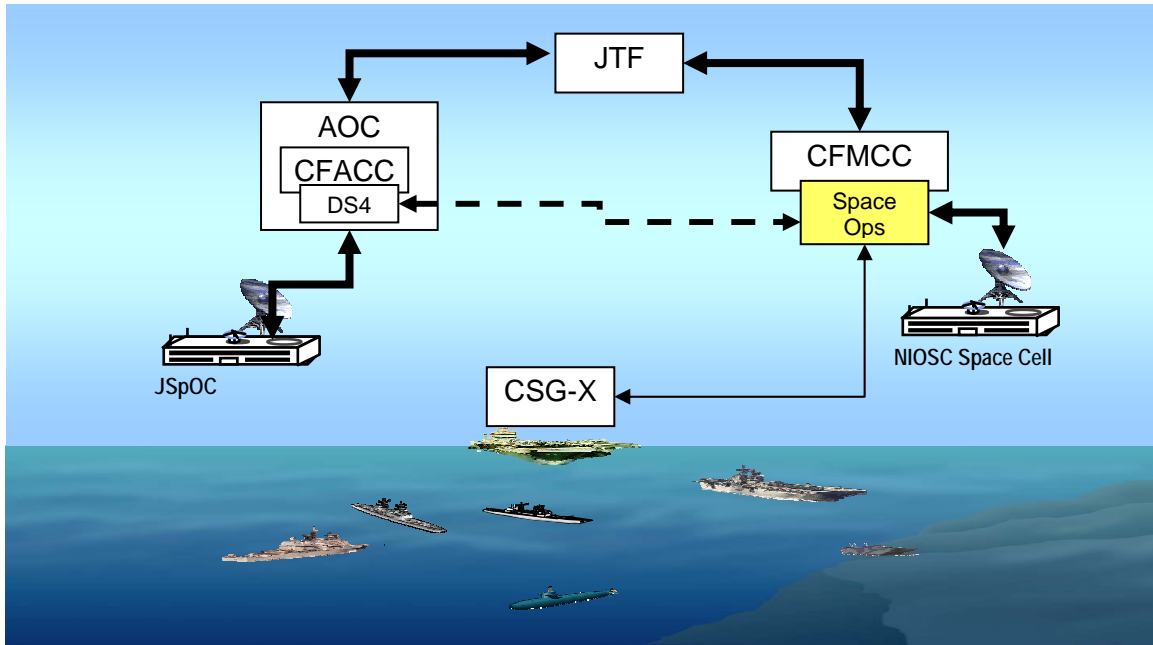


Figure 3. CSG-X Future Space Coordination Construct<sup>65</sup>

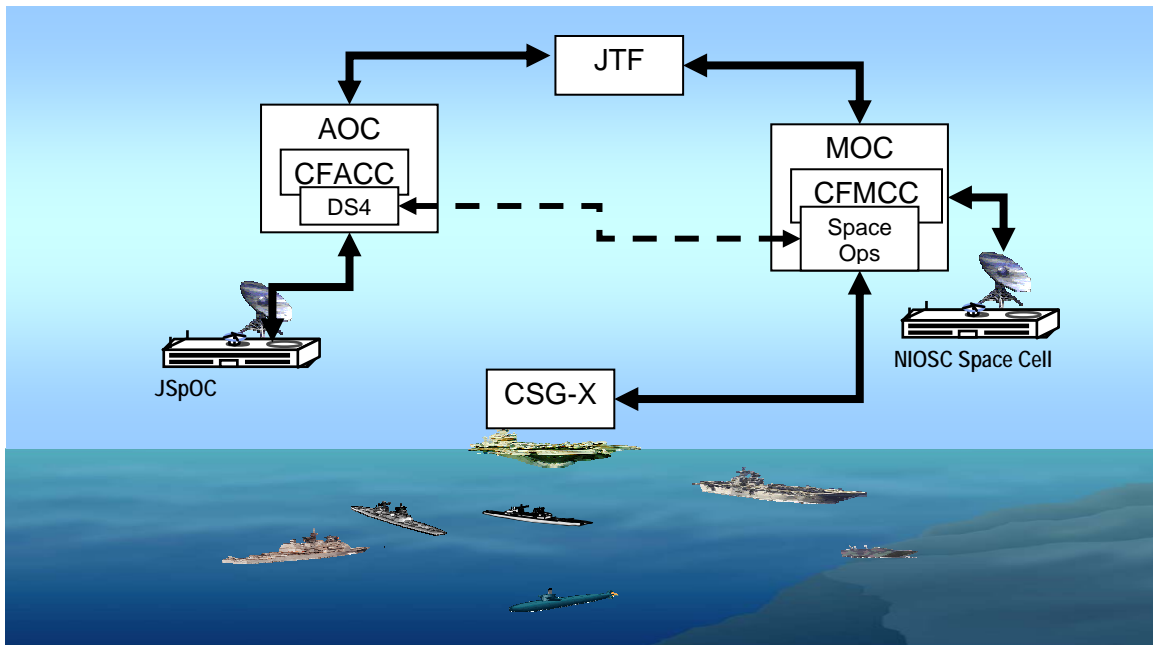


Figure 4. CSG-X Space Coordination Construct with MOC<sup>66</sup>  
[From Naval Space Campaign Brief]

<sup>65</sup> Naval Network Warfare Command, "Naval Space Campaign," (brief, Maritime Headquarters Operational Advisory Group, Norfolk, VA, 06 Jun 2006).

<sup>66</sup> Naval Network Warfare Command, "Naval Space Campaign," (brief, Maritime Headquarters Operational Advisory Group, Norfolk, VA, 06 Jun 2006).

## **B. ARMY C/JFLCC SPACE C2 ARCHITECTURE**

The Army has been developing its theater space support coordination architecture for a number of years. The basic approach that the Army uses to concentrate its development efforts is warfighter focused. The Army recognizes that it does not have the resources or the need to spend time building or flying satellites. Instead, the Army places almost all of its developmental emphasis on leveraging the capability of currently fielded space systems to more effectively support warfighting decision makers at the lowest possible level.

The Army's Space and Missile Defense Command (SMDC) is studying the issue of theater space support from two perspectives. The first perspective represents a current view of theater space support and is discussed in an SMDC document entitled *Army Theater Space Support in Joint Operations – Today*. The second perspective represents a mid-term view that examines theater space support during the timeframe of 2015 to 2024.<sup>67</sup>

### **1. Current CFLCC-level Space Support**

The current Army perspective of theater space support, while focused on developing a unified theater space coordination architecture, includes two parallel programs that support the overall aim. One program is focused on embedding officers with space expertise in the operational level warfighting commands throughout the Army. The other program is focused on refining the support currently provided by the Army Space Support Teams (ARSSTs) that are part of the Army's 1<sup>st</sup> Space Brigade, based at Peterson AFB in Colorado Springs, CO. These two programs are intended to complement each other, despite certain redundancies that exist within their development.<sup>68</sup>

#### **a. Organic SSEs**

In Fiscal Year 2004, the Army began a program whose goal was to embed Space Operations Officers (SOOs) in the headquarters staff of each Army command above the division level. The Army has 10 active divisions (2-star

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<sup>67</sup> Kirby Brown, Director, Space and Missile Defense Battle Lab. Presentation provided to author during a briefing at the Functional Area 40 Training Conference in Long Beach, CA. 31 May 2006.

<sup>68</sup> Army Theater Space Support in Joint Operations – Today, 6.

command), 4 active corps (3-star), and 3 active army (4-star) commands. Two to six SOOs serve on the staff of these echelon commands in what is currently known as a Space Support Element (SSE). By the end of Fiscal Year (FY) 2006, the Army will have fielded SSEs in 7 of 10 divisions, 1 of 4 corps, and 1 of 3 armies. The fielding plan for all SSEs is scheduled to be completed by the end of FY 2009. All officers manning the SSEs come from the Army's Space Operations Functional Area (FA40). The Army has been working to formally define its space cadre and the group of officers known as "FA40s" form the part of the Army Space Cadre known as "Space Professionals."<sup>69</sup>

A key component to this fielding plan is establishing the SSE at the army four-star command level staff. The Army has begun placing 1 Colonel, 2 Lieutenant Colonels, and 3 Majors in an SSE at the Army Central Command (ARCENT) staff at Fort McPherson, GA, which is the Army Component Command for Central Command. With the establishment this SSE, the Army has placed a team of officers with space expertise at the service component command level within a combatant commander's region. Previously, the only service component command to have this resident expertise was the COMAFFOR.<sup>70</sup>

By establishing an ARCENT SSE, the Army now has the opportunity to place full time space expertise on the land component command staff that supports both Operation Iraqi Freedom and Operation Enduring Freedom. Placing this team at the CFLCC level has certain advantages and disadvantages that impact the future theater space coordination architecture.

The primary advantage for establishing an ARCENT SSE is that it provides the CFLCC with the organic capability for identifying space mission related requirements and for conducting space mission related planning for current and future CFLCC operations. Another advantage for creating the

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<sup>69</sup> Clay Scherer. Chief, FA40 Proponent & Army Space Cadre Office, Space and Missile Defense Command. Presentation to author during a briefing at the Functional Area 40 Training Conference in Long Beach, CA. 31 May 2006.

<sup>70</sup> U.S. Army Space and Missile Defense Future Warfare Center, "Army Theater Space Support in Joint Operations – Today," 21.

ARCENT SSE is that it establishes a space team that is parallel to the Air Force's CAOC / DIRSPACEFOR team that resides in the CFACC. By having a parallel position to the DIRSPACEFOR, the land component commander through the ARCENT SSE Chief, which is an O-6 in rank, can ensure that land component space requirements are given equal representation in the theater space coordination process. One last advantage in having the ARCENT SSE team is that it puts space expertise in place at a level that can impact the plans and activities of space forces throughout the theater's land component, which helps ensure a better overall coordinated plan.

In general, establishing an SSE in ARCENT has few negative aspects. One particular disadvantage for establishing an ARCENT SSE has to do with the placement of six field grade officers with space experience at this echelon. The Army has a limited number of FA40s and assigning six field grade officers to this element might be considered an excessive use of senior manpower, especially if part of their function is redundant with other organizations.

***b. Attached ARSSTs***

Since 1993, the Army has fielded teams of soldiers in what are known as Army Space Support Teams (ARSSTs). The intent of an ARSST is to provide space support to a warfighting commander who lacks organic space expertise, but only once the commander requests such a team. Typically, ARSSTs only mobilize for training exercise or major deployments. An ARSST can be attached to an Army division, corps, or theater headquarters and easily integrate into that echelon staff's battle rhythm. An ARSST can also support other ground elements, such as a Marine Expeditionary Force commander.<sup>71</sup>

Ultimately, the Army is looking to leverage the capability of both SSEs and ARSSTs in support of the warfighting commander. In the near term, the basic concept is to ensure that every division commander and above within the land component has either an assigned SSE or an attached ARSST available

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<sup>71</sup> U.S. Army Space and Missile Defense Future Warfare Center, "Army Theater Space Support in Joint Operations – Today," 19-20.

on the staff in order to more effectively use space capabilities. By placing a space team at each echelon, the Army is ensuring that all space activities that affect its operations are well-coordinated and planned throughout the organization. Figure 5 shows an organization chart for space teams within a notional theater and the relationships that exist between them. This figure illustrates how SSEs are organic to the staff at the echelon for which they are assigned. Also, ARSSTs, which are normally assigned to the 1<sup>st</sup> Space Brigade, are attached to the staff at the echelon for which they have been requested.

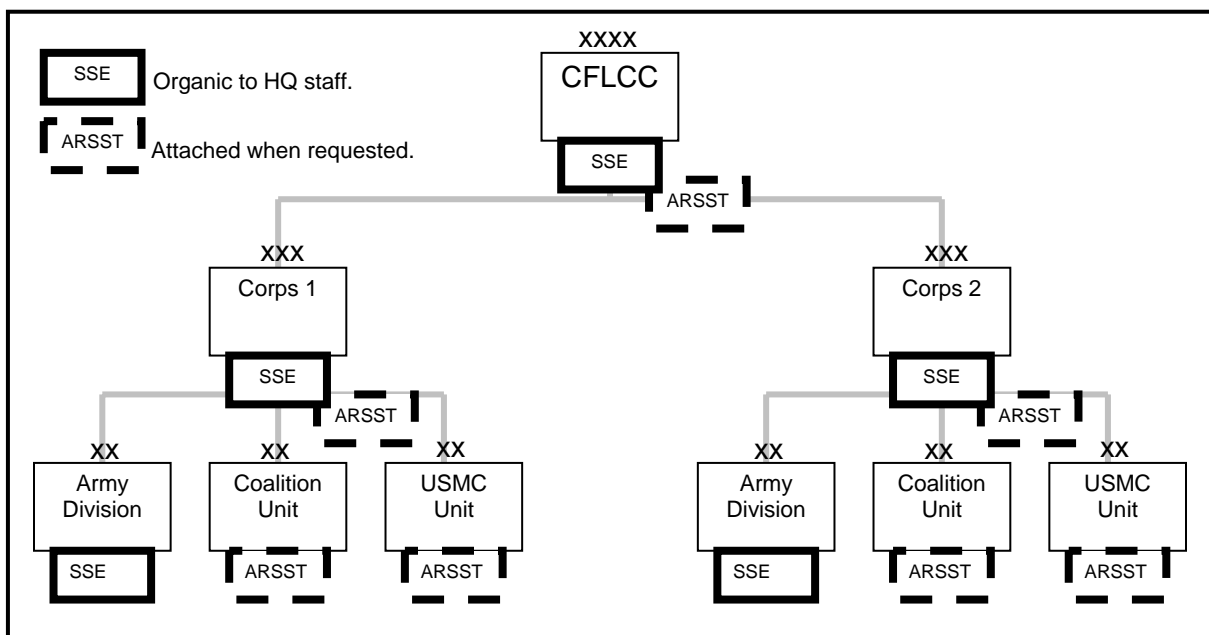


Figure 5. Notional Land Component Theater Space Team Organization

## 2. CFLCC Space Support: 2015 - 2024

In the mid- and long-term, the Army is approaching the concept of theater space support by examining the implications of various DOTMLPF changes. Specific changes in doctrine, organization, training, materiel, and personnel are already beginning to have impacts in the military's use of space capabilities. Technological and materiel advances in the form of new high altitude platforms and sensors will provide an increase in capability in all space mission areas. Doctrine and organizational changes in the form of the Warfighting Headquarters concept will cause a change in space mission area capabilities. The ongoing

evolution of the training and management of military personnel known as space cadre will also help increase the effectiveness of space mission capabilities.<sup>72</sup> How all the services, not just the Army, structure their collective approaches towards theater space support will help determine whether or not the future theater space support architecture succeeds.

Currently, the Army is in the beginning stages of developing its future theater space support concept. This development has taken the form of an Army Concept Capability Plan (CCP) for Space Operations, which is catalogued as Army TRADOC Pamphlet 525-7-4. This Army document is designed to achieve four imperatives. The first is to “facilitate the integration of space capabilities across the full range of Army and Joint operations.” The second is to “improve the Army’s ability to exploit existing space capabilities.” The third is to “deliver space capabilities that address Army needs (capability requirements) and priorities by influencing the design of space-based systems and payloads.” The fourth and last imperative is to “systematically and deliberately evolve Army space support operations over time to provide dedicated, responsive theater focused support to operational and tactical commanders.”<sup>73</sup> Throughout this document, the Army develops its concept for future space operations capabilities within the existing Army concept capability plan framework in order to take advantage of the developmental process that eventually leads towards a Joint Requirements Oversight Council (JROC) approval to enter the Joint Capabilities Integration and Development System process.

The advantage of the Army theater space support development process is that it is evolutionary in nature. The Army is approaching theater space support with a short and long range view in mind while also incrementally increasing its inherent capability to exploit current on-orbit capabilities. The disadvantage to this process lies in the fact that it is an Army-centric process and does not include input from the other services.

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<sup>72</sup> U.S. Army Space and Missile Defense Future Warfare Center, “The United States Army’s Concept Capability Plan: Space Operations – 2015-2024 (Interim Initial Draft),” 5.

<sup>73</sup> U.S. Army Space and Missile Defense Future Warfare Center, “The United States Army’s Concept Capability Plan: Space Operations – 2015-2024 (Interim Initial Draft),” 3.

### **C. U.S. AIR FORCE FUTURE DEVELOPMENT**

The current Air Force theater space coordination construct has been described in detail previously in this thesis, and so will not be repeated here. This section will discuss possible drivers which will affect the future structure of U.S. Air Force space support command and control.

The Joint Warfighting Space (JWS) concept has the potential to require significant refinement in the USAF theater space coordination organization. The reason for this is its combination of forward-deployed space forces with Operationally Responsive Space (ORS). Although the Joint Tactical Ground Station (JTAGS) is a forward-deployed space force, manned jointly by Army and Navy personnel, JWS envisions a significantly more robust forward-deployed presence. One particular application being developed under JWS as a USAF TENCAP project is Combat SKYSAT, a near-space communications relay platform. The future introduction of this system into a theater brings with it significant C2 and airspace control issues for the Air Force to work through.

Another major component of JWS is ORS. The ORS concept combines rapid-response launch vehicles such as SpaceX's FALCON 1 with small, disposable satellites such as TACSAT. The eventual goal of this program is to be able to provide a theater commander with the ability to request and receive the launch of a small satellite tailored to his theater's requirements within a timeframe which meets the operational needs of the particular theater or operation. The eventual development of this capability will require detailed analysis of developing C2 constructs to bring together the theater and global organizations necessary to assemble, launch, and place into operation a satellite dedicated to a specific COCOM. Not only the tasking, but the day-to-day operation of such a satellite are beyond the abilities of the current theater space C2 structure.

Although unlikely to be realized in the near-term, offensive counter-space operations from and through space will require a unique set of command and control processes to ensure their proper use. The balance of appropriate levels

of control with timely and responsive elimination of a threat is only one of many challenges to a C2 organization which offensive counter-space capabilities will pose.

#### **D. SUMMARY**

Each service has unique missions and capabilities, and is responsible to develop the coordination constructs which most efficiently deliver those capabilities to the Combatant Commander. However, those C2 constructs should not be developed in a service-centric vacuum, without regard to concurrent theater or other component development. The current CENTCOM position is to allow each service to develop the C2 construct that suits it best, then work at the theater level to integrate all three. The result of such a process will be lost opportunities, degraded effectiveness and efficiency, and significant amounts of frustration as each service attempts to figure out how the others are organized.



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## VI. SPACE COORDINATION CONSTRUCTS

### A. STATUS QUO

Perhaps the easiest answer to the space coordination dilemma is to maintain the current constructs in place in each theater. Figure 6 depicts the basic space coordination construct in place in the CENTCOM AOR.

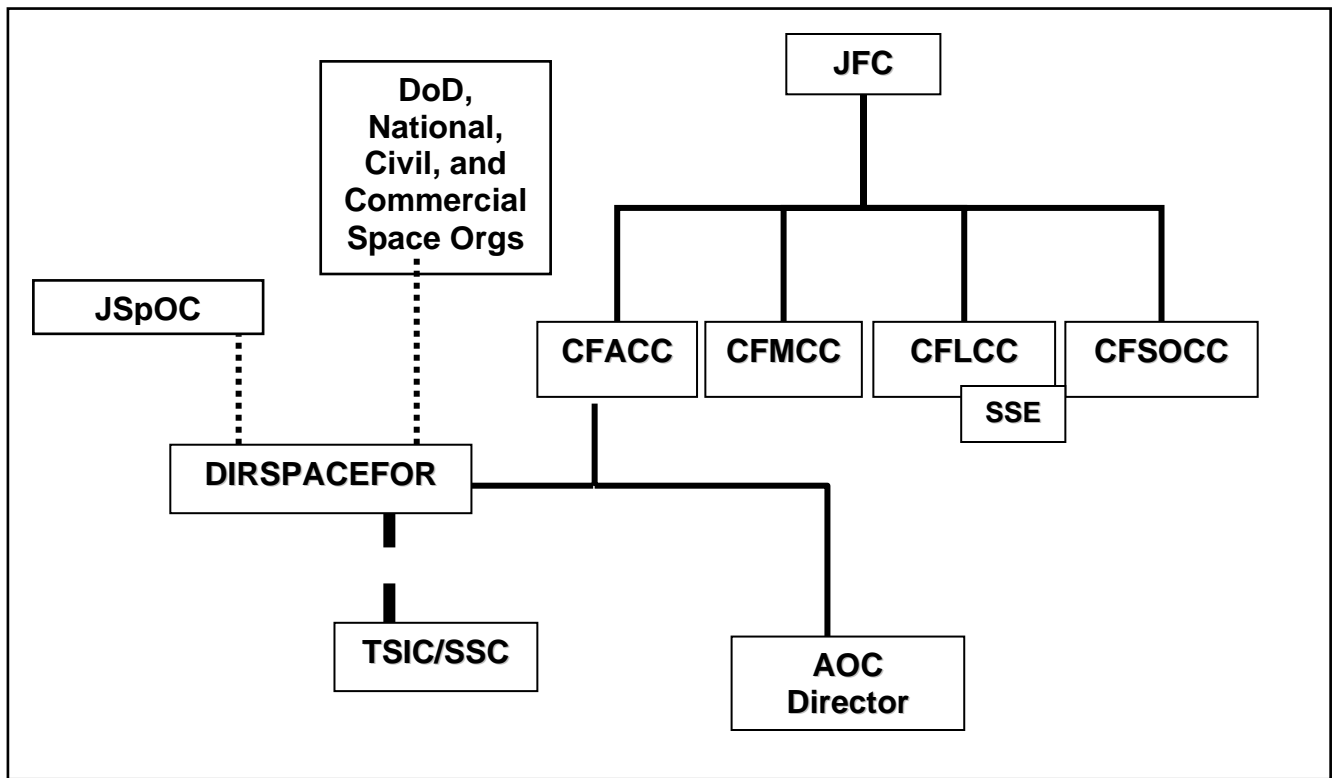


Figure 6. Current CENTCOM Space Coordination Organization<sup>74</sup>  
[After Joint Space AO Coordinating Meeting Brief]

In CENTCOM, the current arrangement is certainly functioning, with modifications being made operationally but not organizationally. The EUCOM AOR has established a different construct which aligns with the commander's philosophy and provides the JFC with a satisfactory level of support and integration. Essentially, each combatant commander has developed a construct which suits its needs and is more or less effective in accomplishing its goals.

<sup>74</sup> After Randy Hugenroth, "Joint Space AO Coordination Meeting," (brief, Washington, D.C., 18 Jan 2006).

Although each JFC has been granted the authority to organize its AOR according to its own desires, that does not imply that each theater should develop a unique construct to execute what are largely the same set of missions. Particularly in the overseas theaters (EUCOM, CENTCOM, PACOM), there ought to be a certain level of standardization regarding organization, so that a force transitioning from one theater to the other is faced with similar or identical command constructs. For the most part, coordination of global space capabilities is a process that would be best served by a set of global standard operations procedures (SOPs) rather than disparate procedures in each theater. Additionally, the interface between the JSpOC and the individual theaters could be facilitated by a standard organization in each AOR.

Maintaining the status quo in each separate theater may be an attractive solution in terms of the combatant commander's autonomy and authority, but as space capabilities and services continue to proliferate through all levels of operation, either a stagnant or disparate space coordination construct will eventually represent a liability to the warfighting commander. While the need for a change in space coordinating construct may not appear to be urgent at the current time, waiting until an imperative for change occurs will most likely result in too little, too late.

## **B. JOINT FORCE SPACE COMPONENT COMMANDER**

Joint Publication 0-2, Unified Action of the Armed Forces, lays out the Department of Defense command organization. According to this document, combatant commanders may organize their forces in the manner which best accomplishes their assigned mission.<sup>75</sup> This organization tends to be set up around Service and functional component commands.<sup>76</sup> Table 1 lists the definitions of functional and service component commands from Joint Publication 0-2. Figure 7 represents a notional organization which represents the baseline from which the theaters have developed their particular organization.

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<sup>75</sup> Joint Publication 0-2: Unified Action Armed Forces. III-4.

<sup>76</sup> Ibid., III-4.

<p><b>functional component command.</b> A command normally, but not necessarily, composed of forces of two or more Military Departments which may be established across the range of military operations to perform particular operational missions that may be of short duration or may extend over a period of time.<sup>77</sup></p>
<p><b>Service component command.</b> A command consisting of the Service component commander and all those Service forces, such as individuals, units, detachments, organizations, and installations under the command, including the support forces that have been assigned to a combatant command, or further assigned to a subordinate unified command or joint task force. See also component; functional component command.<sup>78</sup></p>

Table 1. Component Command Definitions

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<sup>77</sup> Joint Publication 0-2: Unified Action Armed Forces. GL-7.

<sup>78</sup> Ibid., GL-10.

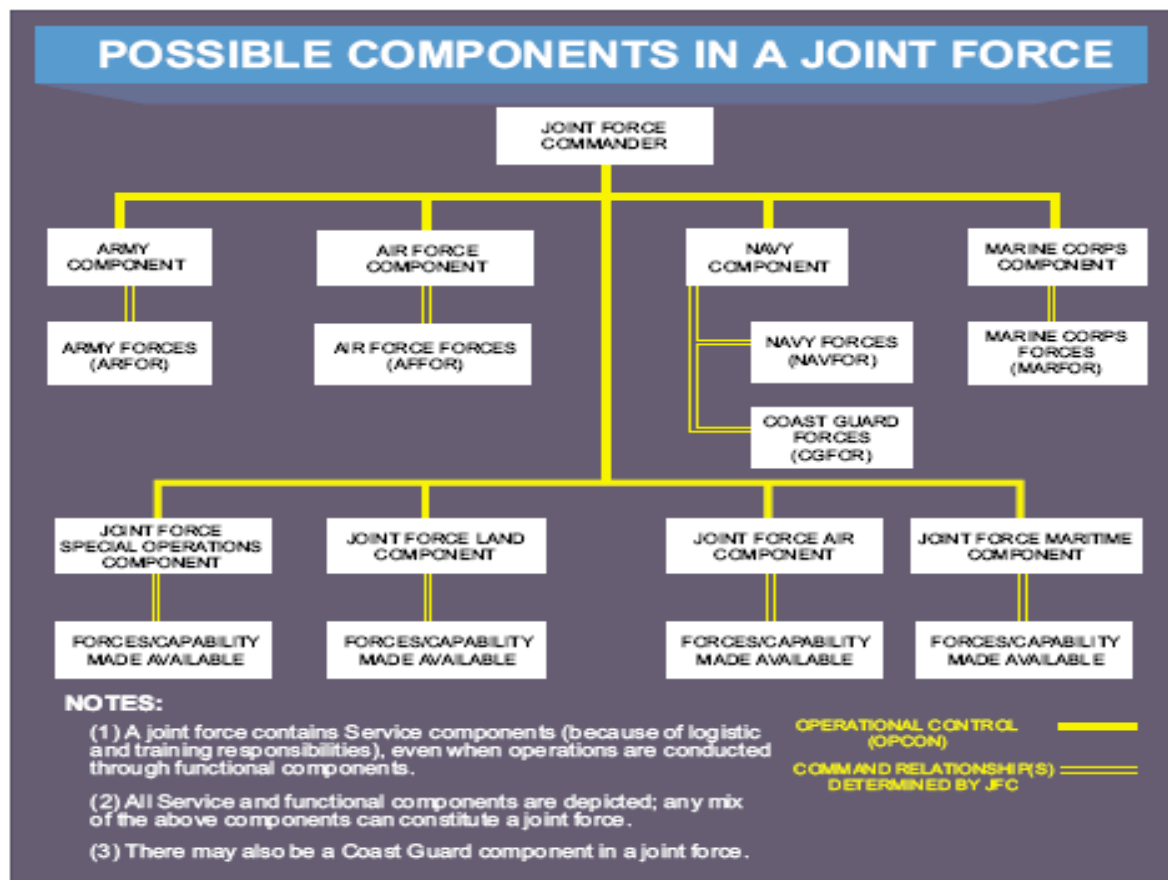


Figure V-1. Possible Components in a Joint Force  
Figure 7. Possible Joint Force Components<sup>79</sup>

Since the joint force organization includes components for land, air, maritime, and special operations, a logical addition to the structure might be a joint force space component commander (JFSCC) (see Fig. 8). This concept has been discussed in several publications since 1992, although it has not yet been adopted.

A single point of contact for space coordination is important to maintaining unity of effort within a theater. The establishment of a JFSCC would provide such a focus, allowing the JFC and other component commanders to work through one component commander to obtain space support and coordinate space operations.

<sup>79</sup> Joint Publication 0-2: Unified Action Armed Forces. V-3.

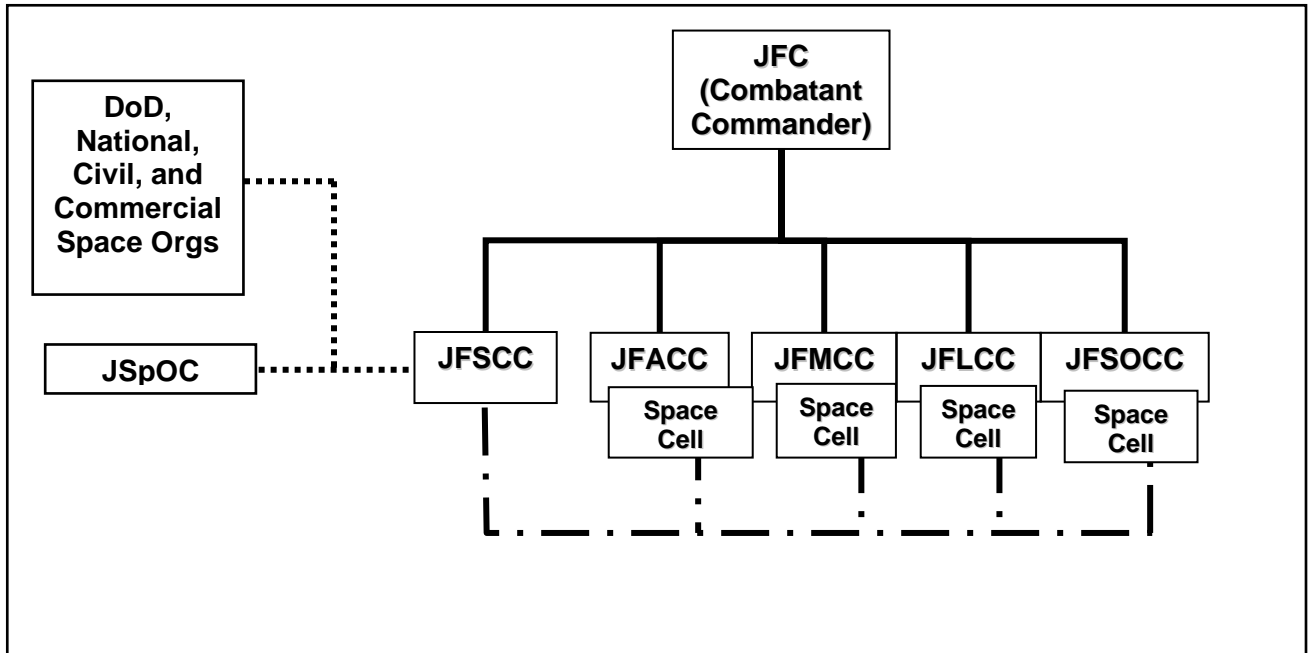


Figure 8. Joint Force Space Component Commander Structure<sup>80</sup>  
[After Joint Space AO Coordinating Meeting Brief]

Another argument for the establishment of a JFSCC is that the DoD controls a minority share of the space systems upon which it depends to carry out its operations. The space systems required by a JFC are largely owned by the intelligence community (for ISR assets), by civilian corporations (for satellite communications), or by other government agencies (for weather assets). Civilian corporations such as Digital Globe operate very capable imaging satellites, whose products represent a very viable asset to a theater commander or his subordinate commanders. With space systems spread among so many different entities, a JFSCC would serve to leverage all available assets from disparate organizations to support operations in his particular theater.<sup>81</sup>

<sup>80</sup> After Randy Hugenholtz, "Joint Space AO Coordination Meeting," (brief, Washington, D.C., 18 Jan 2006).

<sup>81</sup> Larry Price, Maj, USAF, "Space Operations in the Joint Warfighting Arena: The Viability of a Joint Force Space Component Commander," (master's thesis, Air Command and Staff College, Apr 2000), 19.

In an April 2000 research report submitted to the Air Command and Staff College, Major Larry Price investigated the feasibility of a JFSCC and presented the following conclusions with regard to why a JFSCC is the right construct for space coordination in theater:

If the JFSCC idea is recognized within joint doctrine, it may help focus our military as a whole, and certainly those potential JFSCC's, to better integrate space capability throughout joint warfighting tactics, techniques, and procedures. Likewise, it could focus our acquisition and budgeting processes to meet the needs of the JFC first, instead of, for example, building communications enablers for the J6 and intelligence enablers for the J2. Moreover, officially recognizing the JFSCC as part of the joint military structure would help ensure space assets are presented to the JFC in the most effective and efficient manner possible. Additionally, acknowledging space as an AOR –in joint operational doctrine – would legitimize a logical next step in force application.<sup>82</sup>

These conclusions are equally as valid for a JFC-level space coordination cell as they are for a JFSCC.

Major Price's conclusion was that the JFSCC construct was indeed the right answer to the theater space coordination issue, although the time was not right for its development. The paper seems to have a dual view of the JFSCC concept. On one hand, the JFSCC is presented as necessary now in order to drive certain changes which are imperative in the space community (acquisition, TTP development, etc.). On the other hand, the reason given for not implementing the JFSCC in 2000 was that it might be perceived as a separation rather than integration of space capabilities within the joint force.<sup>83</sup>

There are two key assumptions which underlie the creation of a JFSCC. The first is that "space is a medium like the land, sea, and air within which military activities will be conducted to achieve U.S. national security objectives."<sup>84</sup>

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<sup>82</sup> Larry Price, Maj, USAF, "Space Operations in the Joint Warfighting Arena: The Viability of a Joint Force Space Component Commander," (master's thesis, Air Command and Staff College, Apr 2000), 24.

<sup>83</sup> Ibid., 26.

<sup>84</sup> Department of Defense Directive 3100.10, "Space Policy," 6.

The second is that “space forces comprise an important part of the forces available to the Joint Force Commander.”<sup>85</sup>

The conduct of force application in and through space has been a hotly-debated topic for the past several years. While terrestrial military activities are broadly supported by space systems, the mission areas of force application and offensive space control have not yet expanded to include assets in the space medium. The DoD Space Policy lists ballistic missile defense and force projection as examples of the force application mission area.<sup>86</sup> Ballistic missile defense is in its infancy, and force projection is not yet being conducted in the space medium. It is likely to be several more years before technology and policy allow for on-orbit force application assets. Based on the range of operations being conducted in each of the physical mediums (land, sea, air, and space), it seems premature and misleading to define the medium of space as being equal to the other three. While it may become reality in the future, the adoption of that assumption as fact in the current and near-future environment is merely wishful thinking and produces more confusion than clarity.

The other foundational assumption for the establishment of a JFSCC is that the JFC has space forces available to him which could be assigned to a space component commander, just as land, air, or maritime forces are assigned to a theater under the command of their respective component commanders.

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<sup>85</sup> Henry D. Baird, Jr., Maj, USAF, “Is it Time for a Joint Force Space Component Commander?,” (master’s thesis, Naval War College, 19 Jun 1992), 4.

<sup>86</sup> Department of Defense Directive 3100.10, “Space Policy,” 23.



Table 2 provides a review of the terms “operational control” and “tactical control” from Joint Publication 0-2, Unified Action of the Armed Force.

<p><u>Operational Control</u>: OPCON is inherent in COCOM and is the <b>authority to perform those functions of command over subordinate forces</b> involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. OPCON includes <b>authoritative direction over all aspects of military operations and joint training necessary to accomplish missions</b> assigned to the command.<sup>87</sup></p>
<p><u>Tactical Control</u>: <b>TACON is the command authority</b> over assigned or attached forces or commands, or military capability or forces made available for tasking, <b>that is limited to the detailed direction and control of movements or maneuvers</b> within the operational area necessary to accomplish assigned missions or tasks.</p> <p><b>TACON</b> provides the authority to:</p> <ul style="list-style-type: none"> <li>• <b>Give direction</b> for military operations; and</li> <li>• <b>Control designated forces</b> (e.g., ground forces, aircraft sorties, missile launches, or satellite payload management). TACON typically is exercised by <b>functional component commanders</b> over military capability or forces made available to the functional component for tasking.<sup>88</sup></li> </ul>

Table 2. Command and Control Terminology

As a functional component commander, the JFSCC would typically exercise tactical control over space capabilities or space forces made available to him by the JFC. Joint Publication 0-2 discusses the role of a functional commander this way: “Functional component commanders have **authority over forces or military capability** made available to them as delegated by the establishing JFC. Functional component commands may be established across the range of military operations **to perform operational missions** that may be of

<sup>87</sup> Joint Publication 0-2: Unified Action Armed Forces (UNAAF). III-7.

<sup>88</sup> Ibid, III-8

short or extended duration.”<sup>89</sup> According to the DoD Space Policy, space forces are “The space and terrestrial systems, equipment, facilities, organizations, and personnel necessary to access, use, and, if directed, control space for national security.”<sup>90</sup> The question then is what space capabilities or forces does the JFC command which could be made available to a JFSCC? The number of space capabilities or forces deployed to CENTCOM is relatively small. Theater missile defense is a good example of this situation. Joint Tactical Ground Station (JTAGS) units, manned by Army and Navy personnel, execute the warning component of the theater missile defense mission, using data from DSP satellites under the control of Air Force Space Command. The JTAGS detachments are OPCON to JFCC SPACE, and TACON to the COCOM. Meanwhile, the active defense component of the theater missile defense mission is conducted by Army Patriot batteries and Navy ships with the AEGIS combat system. While these units are indirectly under the command of the JFC, they are TACON either to the Army’s senior air defense commander (in the case of the Patriot units) or to the Maritime Component Commander. Other Army space forces, both SSE’s and ARSST’s, are embedded with their parent units, and are only indirectly under command of the JFC. These forces do not represent distinct space forces which are available to a space component commander for TACON. The remainder of space capabilities upon which CENTCOM relies is controlled by several different entities. For example, Air Force space systems such as GPS, MILSTAR, or DSP are commanded by USSTRATCOM through JFCC SPACE, and controlled by Air Force Space Command units. Although these systems all support the COCOM, it is all but certain that actual operational or tactical control of these systems will not be given to the COCOM due to their ongoing national and strategic missions. Therefore, CENTCOM, and other JFC’s, do not actually command any space forces (as DoD Space Policy defines them, at least), which could be assigned to

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<sup>89</sup> Joint Publication 0-2: Unified Action Armed Forces (UNAAF). V-18.

<sup>90</sup> Department of Defense Directive 3100.10, “Space Policy,” 23.

a space component commander. The role of a space component commander is unclear, since no “forces...or military capability”<sup>91</sup> could be made available to that commander.

Based on the current organization of space forces and capabilities, as well as the prognosis for near-term developments, the establishment of a JFSCC does not appear to be appropriate or beneficial to a JFC. If, in the future, elements of programs such as the Air Force’s Joint Warfighting Space begin to be fielded in theater, or force application from on-orbit platforms becomes a reality, the concept of a JFSCC should be revisited for applicability.

### C. THEATER SPACE COORDINATION CELL

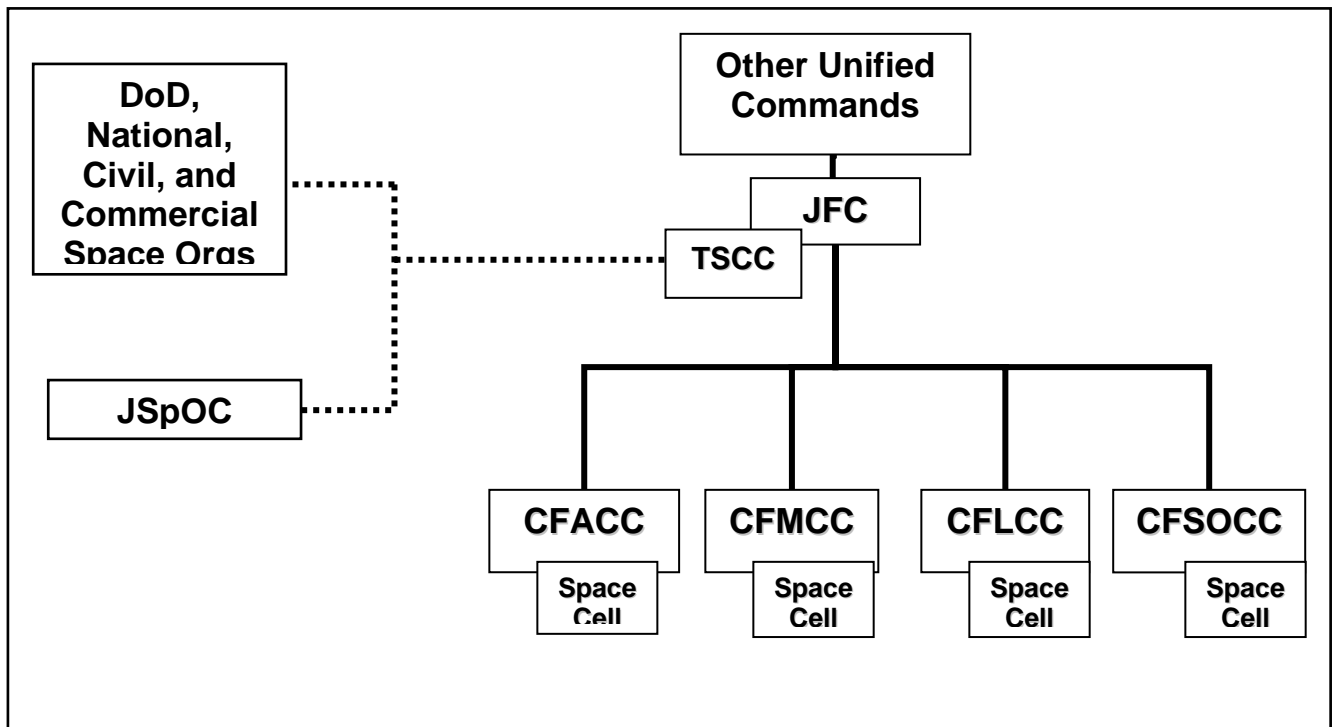


Figure 9. Theater Space Coordination Cell<sup>92</sup>  
[After Joint Space AO Coordinating Meeting Brief]

<sup>91</sup> Joint Publication 0-2: Unified Action Armed Forces (UNAAF). III-8.

<sup>92</sup> After Randy Hugenroth, “Joint Space AO Coordination Meeting,” (brief, Washington, D.C., 18 Jan 2006).

The third way to do this is with a permanent and standardized Theater Space Coordination Cell (TSCC) at the COCOM level (Fig. 9). The TSCC could serve as either a special staff officer on the JFC staff or as a staff position inside the JFC J3. Rather than delegate SCA to a subordinate functional component command, the JFC would retain SCA at the COCOM level and the TSCC would exercise SCA across the theater. The person assigned to lead the TSCC should be at least an O-6 with a significant amount of combined space and theater expertise. Establishing this billet as a permanent position on the JFC staff helps to ensure that the combatant commander has a space expert that is also focused on theater issues. The individual leading the TSCC can come from any service and should have a small joint-minded staff that can conduct concurrent planning. The TSCC concept provides certain advantages over both the status quo and the JFSCC concepts.

A joint structure would remove the competition for theater SCA that is growing between the various services, especially the Army and the Air Force, as part of the status quo. Joint Force Commanders traditionally delegate SCA to the JFACC because of the Air Force's command and control systems and institutional space expertise. Once the Army implements its concept of theater space support, a combatant commander might be induced to delegate theater SCA to the JFLCC instead of the JFACC based on both the Army's preponderance of space forces and its high degree of use of space capabilities. Ultimately, delegating theater SCA to the JFLCC instead of the JFACC does not solve the theater space coordination problem – it would simply move the same problems to a different functional component. By not delegating theater SCA, the JFC, through the TSCC, objectively ensures the proper implementation of all space capabilities.

An advantage that the TSCC concept has over the JFSCC concept stems from the amount of resources that would be necessary to implement the concepts. The TSCC could function in concert with the existing JFC staff and would most likely require fewer than a dozen space experts, with all services being represented. The JFSCC concept would require the establishment of a

separate and independent functional component command that would need many dozens of personnel in order to interface with the JFC staff as well as the other functional component commands. Creating the TSCC internal to the JFC staff would require far less resources than creating a JFSCC subordinate to the JFC.

The TSCC concept also fits well into future theater command and control architectures. Joint Forces Command has developed the Standing Joint Force Headquarters, which, among other things, is an attempt to standardize the theater commander's warfighting headquarters architectures. As part of this initiative, JFCOM is developing a system of networked operation centers that are organized around the functional component commanders. As each theater develops a standardized headquarters organization which is designed to rapidly stand up as Joint Force Headquarters, it makes sense that the space coordination organization, which ought to be a vital part of operational planning, is similarly standardized across all theaters. Figure 9 illustrates this standardization by embedding space expertise in each of the major components inside the JFC commander's organization. The JFC commander and staff, which includes the TSCC, operate a Joint Operations Center (JOC). Accordingly, the JFLCC and its organic space cell in the form of an ASCC SSE operates a LOC. The JFACC operates an AOC, which includes its embedded space cell and the DIRSPACEFOR. The JFMCC operates a MOC, which also has an internal space cell. The relationship between the TSCC and the subordinate space cells would be the same as the relationships for every other staff section and warfighting discipline in order to take advantage of the concept's standardization.

The TSCC concept has one final advantage over both the status quo and the JFSCC. The TSCC concept provides an embedded pre-war space planning capability that has previously not existed. In the past, combatant commanders have requested liaison officers from either USSPACECOM or USSTRATCOM to help complete war planning. This type of support has proved useful but there is a better way. Rather than bring in liaison officers to advise war planners on how space capabilities can support the existing plan, a resident TSCC can advise the

war planners on how to leverage space capabilities throughout the planning process. The result is a much more integrated plan that identifies the shortcomings of space capabilities early so that other resources can be identified to achieve the plan's required outcomes. Since the military cannot predict where the next crisis is likely to occur, the presence of imbedded space planners at the JFC level will ensure that space capabilities are included in the future plans and current operations of all theaters.

The TSCC provides many advantages over both the status quo, which suffers from inter-service rivalry and competition, and the JFSCC concept, which would suffer from additional bureaucratic and resource constraints. The TSCC will provide a single coordination point that all services can interface with equally. The individual that serves as the TSCC will be a permanent part of the JFC team rather than a temporary solution that comes from outside of the organization. Ultimately, the TSCC concept is the most beneficial solution for the command and control of theater space coordination.

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## **VII. FINAL CONCLUSIONS AND RECOMMENDATIONS**

### **A. THESIS SUMMARY**

The development of a theater space coordination architecture is a dynamic process. The interweaving of global assets with theater requirements presents a formidable set of challenges. While each theater places a disparate set of demands on space capabilities, those capabilities are delivered by assets which are globally distributed and centrally controlled. This presents a somewhat unique situation in the world of military command, control, and coordination, as combatant commanders are not able to physically control the assets upon which they rely. Therefore, each COCOM must work out a coordination strategy with which to interface with the central controller of each particular asset.

The command and control of space assets is in itself a significant problem, and beyond the scope of this thesis. As USSTRATCOM continues to refine its organization, and JFCC SPACE achieves IOC, the ability of JFCC SPACE to both command and control DoD assets, and influence other National Security Space agencies will most likely grow. It is reasonable to assume that in a few years, a relatively streamlined concept of operations will begin to be executed by the JSpOC in support of combatant commanders worldwide.

As the providers of space capabilities refine their organization, it is important that the customers also develop standardized organizations and concepts of operations. While various options present themselves, each must be reviewed carefully for its distinct advantages and disadvantages. The spectrum of choices ranges from maintaining the status quo to the addition of a completely separate functional component commander to the JFC structure. The status quo option, based on a hastily-developed DIRSPACEFOR concept, is certain to become inadequate in the future, and in its current form has several drawbacks. A joint space functional component, on the other hand, is inappropriate given the current command and control structure of space forces, as a space component commander would have no forces over which to exercise operational or tactical



control. Additionally, the resources required to stand up a separate functional component commander in each theater would be nearly prohibitive. The manning for the new JFCC SPACE organization is proposed to be approximately 131 personnel, which in that case are reorganized rather than newly-created billets.<sup>93</sup> For a single JFSCC to stand up, the potential of having to create and man over 100 completely new billets, along with developing the infrastructure to support the command, is a significant drawback.

A middle option along the spectrum is the assignment of a theater space coordination cell to the joint force commander's staff. Such a coordination cell would require a relatively small footprint; indeed, the DIRSPACEFOR is conducting business with fewer than a dozen personnel spread throughout the AOC, none of whom are dedicated to support his position. Placement at the theater level would give the space cell visibility across the range of operations being conducted by each functional component, and allow for early integration of space capabilities into future planning and current operations. The establishment of a cell at the joint force level would open the leadership of the cell up to senior officers of all services, and allow the coordination cell to speak with the voice of the combatant commander in the space capabilities coordination process. For the near future of theater space coordination, this option appears to be the best, in terms of more effectively fulfilling operational requirements as well as simplicity of execution.

The development of a common theater space coordination architecture is admittedly not as immediate a priority as defeating improvised explosive devices in Iraq or halting the spread of Al Qaeda in the Horn of Africa, yet it will have an effect on every single operation undertaken in a theater. The contribution of space capabilities to current operations resembles the advertising motto for the BASF Corporation: "We don't make a lot of the products you buy. We make a lot of the products you buy better.®"<sup>94</sup> While space is not a peer medium of

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<sup>93</sup> Joint Functional Component Command for Space, "JFCC SPACE Stand-Up: Request to the Manpower Validation Board" (brief, Omaha, NE, 24 Jul 2006).

<sup>94</sup> BASF, <http://www.basf.com/corporate/newsadvertising.html>. Accessed Aug 2006.

operations with the land, sea, or air (in the sense of physical operations being conducted in it), it contributes in significant ways to all of those operations, making them more efficient and effective. In fact, the denial of services provided by any single space capability would have an extremely detrimental effect on a theater's warfighting capabilities. While current operations in CENTCOM or other theaters are not likely to fail because space is not fully utilized, it is certain that the integration and coordination of space capabilities at the appropriate level of command will result in measurable increases in the effectiveness and efficiency over the range of military operations. In an age where resources of all kinds are in short supply, a construct which provides the ability to fully leverage global space capabilities in support of theater operations will quickly prove its worth.

The introduction of the DIRSPACEFOR has proven to be a solid initial step, as focused space expertise is being brought to bear in CENTCOM to innovatively support current operations and provide theater-wide support for such areas as GPS interference and defensive counter-space. As the window opens for the revision of JP 3-14, and after three years of refining the DIRSPACEFOR construct, it is time to take the next evolutionary step and elevate the theater space coordination role to the joint level. The establishment of a Theater Space Coordination Cell would have several positive effects. First, it would provide the staff charged with theater space coordination with a truly theater-wide view, both in the planning and operations regimes. Second, it would ensure that the theater requirements for space capabilities are voiced to providers directly by the COCOM, rather than being filtered through several layers of command. Lastly, it would allow senior space personnel from all services to serve in a joint position, rather than excluding all but Air Force officers from the role.

## **B. FURTHER QUESTIONS**

Much work remains to be done in the area of theater space coordination; this thesis has barely begun to scratch the surface. The establishment of a Theater Space Coordination Cell would bring with it unique challenges which further research might address. Some of these questions might be:

1) Should the TSCC be assigned within a branch of the JFC staff, such as the J-3 (Operations), or should it exist as a separate entity responsible directly to the COCOM or his deputy? A cogent argument could be made for either answer, but certainly one choice would be preferable to the other.

2) How would each functional component organize itself to interface with the TSCC? Should the DIRSPACEFOR position remain, at a perhaps lower rank, and the other functional components develop an internal space cell to focus on their particular medium of operations? This seems to be the direction in which the Army is moving, and is being proposed in the Navy as well. How these proposed structures develop depends largely on the communication of their value added to those who will be asked to resource their creation.

3) Is the JFC the only level at which a TSCC should exist? The CENTCOM theater arrangement is somewhat unique, as the geographic theater is separated into sub-unified commands such as Combined Joint Task Force – Horn of Africa, Multi-National Corps Iraq, and Combined Forces Command Afghanistan. Should there be a space coordination cell at each of these command levels which could interface with the TSCC?

4) What is the trend of Space Support Requests being sent to the DIRSPACEFOR, and how would that be impacted by shifting to a TSCC model? The CENTCOM DIRSPACEFOR maintains a list of SSR's on the SIPRnet; a list of Army SSE and ARSST sitreps is also available. The comparison and analysis of these lists would provide insight into areas where the TSCC could make more impact, or ways for it to better support each functional component. This analysis would be valuable in the near term as a method for gaining further insight into the three coordination constructs presented here, and selecting the best one.

5) What are the baseline roles and responsibilities of the organization which executes Space Coordinating Authority? Air Force doctrine is explicit about what the position executing SCA ought to do; joint doctrine has not yet reached that level of detail. An analysis which takes a realistic view of the desired roles of the space coordinating authority would be of great value.

### **C. CONCLUSION**

Space capabilities are an inseparable part of modern military operations. The tension between global assets, centralized command and control, and theater requirements and coordination presents a challenge to the development of a common structure. Such a development, though, is foundational to increased efficiency and effectiveness of resource-limited military operations. The next evolutionary step in this development is the elevation of the space coordination role to the Joint Force Commander's staff, and standardizing this construct globally.

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## **APPENDIX: SIGNIFICANT DEFINITIONS**

The Appendix provides further detail on the definitions presented in Chapter II. In some cases, the doctrinal definitions have been edited for length in order to present the most relevant portions.

### **A. ORGANIZATIONS**

#### **1. Joint Functional Component Command for Space (JFCC SPACE)**

In July 2006 Commander, U.S. Strategic Command disestablished JFCC SGS and established JFCC SPACE. The following is an excerpt from the STRATCOM Implementation Directive outlining the roles and responsibilities of JFCC SPACE:

**JFCC SPACE CONCEPT:** As directed by Commander, USSTRATCOM, (CDRUSSTRATCOM) the CDR JFCC SPACE will serve as the single point of contact for military space operational matters to plan, task, direct, and execute space operations. CDR JFCC SPACE will direct the continuous planning and execution of assigned space operations missions...In close coordination with the headquarters staff and JFCC GSI, JFCC SPACE will conduct space operational-level planning, integration, and coordination with other USSTRATCOM joint functional and service components, other Combatant Commanders [through their Space Coordinating Authority (SCA)], and other DoD, and when directed, non-DoD partners to ensure unity of effort in support of military, national security operations, and support to civil authorities.

**AUTHORITIES:** CDR USSTRATCOM will supervise the exercise of authorities delegated in this directive. The CDR JFCC SPACE is assigned the following authorities:

- a. Coordinating Authority for planning and execution of space operations.
- b. Operational Control (OPCON) of designated space and missile warning forces, as directed by USSTRATCOM.
- c. Direct Liaison Authority (DIRLAUTH) between JFCC SPACE and other joint functional and service components, combatant commanders, and agencies while keeping headquarters informed. JFCC Commanders are encouraged, consistent with DoD rules and

regulations, to develop robust coordinating relationships, to include inter-agency and combined forces where required, to enhance operational mission effectiveness.<sup>95</sup>

## **2. Air and Space Operations Center (AOC)**

The AOC is the senior C2 element of the TACS and includes personnel and equipment of the necessary disciplines to ensure the effective conduct of air and space operations (e.g., communications, operations, intelligence, etc.). As the operations command center of the JFACC, it provides the capability to plan, task, execute, monitor, and assess the activities of assigned or attached forces. When the JFACC is designated as the AADC, ACA, and SCA, these functions are also performed through the AOC. The AOC monitors execution of air operations and directs changes as the situation dictates. As the focal point of the TACS, the AOC should have secure and redundant communications with operations, logistics, weather, and intelligence centers, higher and lateral headquarters, as well as subordinate units to preclude degradation in its ability to control air forces.

### **AOC Organization**

The baseline AOC organization includes an AOC commander, five divisions (Strategy, Combat Plans, Combat Operations, ISR, and Air Mobility), and multiple support/specialty teams. Each integrates numerous disciplines in a cross-functional team approach to planning and execution. Liaisons from other Service and functional components may also be present to represent the full range of joint air and space capabilities. The following provides a summary of the major elements of an AOC.

- The **AOC Commander** is charged with effectively managing air and space operations and establishing the AOC battle rhythm. The AOC commander commands the AOC weapons system (but not AETF forces).
- The **Strategy Division** concentrates on long-range planning of air, space, and information operations to achieve theater objectives by developing, refining, disseminating, and assessing progress toward achieving the JFACC air and space strategy.
- The **Combat Plans Division** applies operational art to develop detailed execution plans for air and space operations.

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<sup>95</sup> General James E. Cartwright, USMC, memorandum, 19 Jul 2006, Joint Functional Component Command for Space – Implementation Directive.

- The **Combat Operations Division** monitors and executes current operations. The Combat Operations Division is also the focal point for monitoring the execution of joint and combined operations, such as time sensitive targeting (TST), TMD, Joint Suppression of Enemy Air Defense (JSEAD) supported by theater forces, and Joint Air Attack Team (JAAT).
- The **ISR Division**, in conjunction with the Strategy, Combat Plans, Combat Operations, and Air Mobility Divisions, plans and executes airborne ISR operations and provides combat ISR support to air and space planning, execution, and assessment activities.
- The **Air Mobility Division** plans, coordinates, tasks, and executes the theater air mobility mission. Unlike the other AOC divisions, which work solely for the AOC commander, the AMD coordinates with the DIRMBOFOR-Air but must remain responsive to the tempo and timing of the AOC commander's operation. The DIRMBOFOR-Air is responsible for integrating the total air mobility effort for the JFACC and, in this capacity, coordinates with the AMD on behalf of the JFACC to execute the air mobility mission.<sup>96</sup>

### 3. **FALCONER Air Operations Center**

To plan, execute, and assess air and space power, the US Air Force has developed a series of tailored air and space operations centers (AOCs) that can be networked to provide the full range of air and space power to a joint force. *Because air and space forces are not monolithic in execution and force presentation -- some are organized regionally, others functionally -- the nature of AOCs has been tailored to better plan and execute this mix.* The AOC weapon system (AN/USQ-163) is also known as the "Falconer." It is the operations command center of the JFACC and provides the capability to plan, task, execute, monitor, and assess the activities of assigned or attached forces... Although the US Air Force provides the core manpower capability for the AOC, other Service component commands contributing air and space forces, as well as any coalition partners, may provide personnel in accordance with the magnitude of their force contribution. The AOC can perform a wide range of functions that can be tailored and scaled to a specific or changing mission and to the associated task force the COMAFFOR presents to the JFC. Thus, for smaller scale

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<sup>96</sup> Air Force Doctrine Document 2, Operations and Organization. 63.



operations, the US Air Force would not necessarily provide all of the elements described in the following sections if the situation does not warrant them.<sup>97</sup>

#### **4. Joint Space Operations Center (JSpOC)**

The JSpOC is the operational command and control (C2) center that provides Commander, JFCC SGS (CDR JFCC SGS), via the Commander, Joint Space Operations (CDRJSO), the capability to plan, task, direct, synchronize, and assess the activities of assigned and attached space forces (as well as those space forces made available for tasking)... CDR JFCC SGS executes OPCON of space forces via the JSpOC at Vandenberg AFB, CA.

The primary functions of the JSpOC are to:

1.2.2.1. Develop a global space operations strategy to meet CDRUSSTRATCOM objectives and guidance.

1.2.2.2. Assist development of theater space operations strategy to meet geographic unified commander objectives and guidance through robust interaction with theater AOCs.

1.2.2.3. Produce and disseminate the Joint Space Tasking Order (JSTO).

1.2.2.4. Task and execute day-to-day space operations for assigned and attached space forces.

1.2.2.5. Receive, assemble, analyze, filter and disseminate space-related all-source intelligence and weather information to support air and space operations planning, execution and assessment.

1.2.2.6. Conduct operational-level assessments to determine mission and overall space operations effectiveness as required by CDRUSSTRATCOM and other geographic unified combatant commanders to support global and theater combat assessments.<sup>98</sup>

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<sup>97</sup> Air Force Doctrine Document 2, Operations and Organization. 94.

<sup>98</sup> Air Force Operational Tactics, Techniques, and Procedures 2-3.4, Joint Space Operations Center (Draft), 20 Jan 2006:1.

## **5. Standing Joint Force Headquarters**

### **a. Joint Warfighting Center**

A full-time, joint C2 element that is part of the geographic CDR's staff. The SJFHQ focuses on deliberate and crisis action planning and is a fully integrated participant in the GCC staff's planning and operations activities. The SJFHQ exploits new organizational and operational concepts and technology to enhance the command's peacetime planning efforts, accelerate the efficient formation of a JTF HQ, and facilitate crisis response by the joint force.<sup>99</sup>

### **b. U.S. Forces Command Website**

The mission of the Standing Joint Force Headquarters (SJFHQ) is to provide the warfighter with a trained, standing core element to enable the joint task force commander to command and control joint and multinational assigned forces.

**SJFHQ core elements at combatant commands:** U.S. Joint Forces Command (USJFCOM) developed and tested a conceptual model and created standards and certification criteria for deployable SJFHQ core elements (SJFHQ-CE) at combatant commands. The command rigorously tested and refined the conceptual model through a series of major experiments and exercises. As a result, the Secretary of Defense directed combatant commanders establish SJFHQ core elements by 2005.

**How does it work?** A SJFHQ-CE brings a group of 57 experts in command and control procedures together to help integrate air, land, maritime and information capabilities at a joint task force headquarters (JTF HQ). Once the new JTF HQ is fully functional and supported, the SJFHQ-CE can be withdrawn to reconstitute and prepare for its next assignment.

When not operationally deployed, SJFHQ-CEs assist the service headquarters in training to become a joint task force headquarters.

**What are the employment options for a SJFHQ-CE?** Combatant commanders has three primary options for employing SJFHQ-CEs:

- SJFHQ-CEs can serve as the nucleus or core of a JTF HQ staff, but are not manned to be a fully operational headquarters without broad augmentation.

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<sup>99</sup> U.S. Joint Forces Command, "Pamphlet 3 – Doctrinal Implications of the Standing Joint Force Headquarters (SJFHQ)," 1. [http://www.dtic.mil/doctrine/jel/other\\_pubs/jwfc3.pdf](http://www.dtic.mil/doctrine/jel/other_pubs/jwfc3.pdf). Accessed May 2006.

- SJFHQ-CEs can provide key augmentation personnel to JTF HQ and facilitate the rapid transition of a service component headquarters to a JTF.

- Combatant command headquarters can retain a SJFHQ-CE. In this situation, the command forms a warfighting headquarters executing operations through subordinate JTFs or service components.

**Impacting future JTF HQs:** The SJFHQ-CE concept supports how we fight today yet is flexible enough to be shaped to support tomorrow's fighting force.

**The SJFHQ-CE concept will enable JTFs of the future to:**

- Rapidly activate with trained and skilled personnel.
- Plan and execute faster than the adversary.
- Integrate with non-military elements of national power for crisis resolution.<sup>100</sup>

## **6. Director of Space Forces (DIRSPACEFOR)**

*Within an AETF, the DIRSPACEFOR serves as the senior space advisor to the JFACC. The DIRSPACEFOR, a US Air Force space officer, coordinates, integrates, and staffs activities to tailor space support to the JFACC. In addition, when the JFACC is designated as SCA, the DIRSPACEFOR will work the day-to-day SCA activities on behalf of the JFACC. If the COMAFFOR is neither SCA nor the JFACC, the COMAFFOR should establish a space liaison to the JFACC through an ACCE. The DIRSPACEFOR is part of the JFACC's special staff. Whether a permanent member of the theater MAJCOM staff or provided to the theater by Air Force Space Command (AFSPC), the DIRSPACEFOR should be pre-identified to allow that officer time to become familiar with that theater's space requirements. The DIRSPACEFOR's specific responsibilities include:*

- Provide senior space perspective for strategy and daily guidance development, target selection, force enhancement to terrestrial operations, and special technical operations
- (STO) activities relating to space operations.

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<sup>100</sup> U.S. Joint Force Command, "Standing Joint Force Headquarters Core Element," [http://www.jfcom.mil/about/fact\\_sjfhq.htm](http://www.jfcom.mil/about/fact_sjfhq.htm). Accessed May 2006.

- Facilitate AFSPC, USSTRATCOM, and national support to the JFC.
- Provide assistance to the JFACC in determining and achieving military space requirements.
- Assist regional AOC staff in developing and staffing space related operational requirements and policy matters.
- Recommend appropriate command relationships for space to the JFACC.<sup>101</sup>

## **7. Army Space Support Team (ARSST)**

The ARSSTs are USASMDC assets from the Active Army, USAR and ARNG. ARSSTs rapidly deploy worldwide within 48 hours to augment corps and division space expertise, normally within the G3 section, during exercises and contingency operations, including combat operations. Their primary support is at the operational and tactical levels. ARSSTs may be assigned to support other levels in Army or non-Army units.

### **Capabilities**

C-1. The mission of the ARSST is to deploy worldwide to provide force enhanced space support during operations and exercises. The ARSST brings with it a comprehensive variety of capabilities and products. Some are organic capabilities, ranging from subject matter expertise to specific tools such as topographic map printers. The strength of the support team concept is in its forward presence, which gives a front-line awareness of Army warfighter needs and the ability to provide fast, tailored solutions.

C-2. In coordination with the G3 space element, the ARSST provides tailored, task organized space resources to assist the supported command in the areas of SATCOM, PVT; environmental monitoring, ISR, missile warning, and other theater-tailored space information. Each team is trained and equipped to network using space information channels from many sources.

C-3. ARSSTs provide space expertise. Team members have an in-depth understanding of red, gray, and blue space orders of battle, the operational capabilities and threats imposed, and implications

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<sup>101</sup> Air Force Doctrine Document 2, Operations and Organization. 63.

for land force operations. The ARSST also assists the supported command in space control planning/understanding. When the supported command is a joint task force (JTF), the ARSST can be a conduit for planning and requesting the integration of Army space control capabilities in the operation.

C-4. The ARSST facilitates joint, interagency, and multinational, as well as Army operations. ARSSTs assigned to the combined force land component commander (CFLCC) host Air Force, Navy, and Marine planners and space experts to improve multi-Service and joint operations.

C-5. In coordination with the G3 space element and the G2, ARSSTs support the space contribution to the IPB process. In coordination with the G3 space element, the ARSST supports the space estimate process. The ARSST provides space operations assessments and information to the G2, G3, G6, and other staff sections as appropriate. They, in turn, provide final staff assessments and determine impacts on communications, operations, and intelligence. The ARSST members integrate space into operations through participation in the military decisionmaking process by developing the space operations annex and providing current space-related information. The ARSST synchronizes space support and threat information in the unit execution matrix.<sup>102</sup>

## **8. Space Support Element (SSE)**

The future force tactical headquarters is designed to perform tactical and operational level missions. The tactical headquarters is ARFOR/JFLCC capable without augmentation, and serves, with augmentation, as the JTF headquarters. The tactical headquarters contains an SSE, nominally consisting of two FA 40 SOOs. In peacetime or garrison operations, these space experts form an SSE within the G3 current operations section. In an operational or tactical situation, the SOOs in the SSE are in the main command post and provide or coordinate space support for other command posts. Generally, during field operations, one SOO provides space insight for planning future operations while the other supports current operations. The senior officer may adjust this support ratio, depending on METT-TC. Because of the small size of the SSE, it may be augmented by an ARSST.

E-1. The functions of the SSE at the main command post (CP) include the following:

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<sup>102</sup> Field Manual 3-14: Space Support to Army Operations. C-1.

- Provide tactical and operational space planning and support to the tactical headquarters.
- Advise on space force enhancement and space control mission areas.
- Advise on availability and use of military/civil/commercial spacebased assets.
- Advise regarding the capabilities, limitations, and status of missile warning systems.
- Produce space support annex and space input to estimates/OPLANs/FRAGOs/warning orders.
- Prepare the space estimate tab to the space support annex to the OPLAN (see appendix A).
- Support preparation of space portion of IPB and space order of battle.
- Participate in initial targeting process.
- Advise regarding space support to IO.
- Provide space support products and services.
- Synchronize space operations and effects with TAC CP 1.
- Recommend/coordinate for additional space support and force structure.
- Coordinate with higher headquarters space element.

E-2. The functions of the SSE at the TAC CP 1 include the following:

- Provide 24/7 space support to the tactical headquarters.
- Advise regarding space force enhancement mission area.
- Advise regarding space control mission area.
- Advise on BFT capabilities and limitations.
- Advise on availability and use of military/civil/commercial spacebased assets.

- Advise on capabilities and limitations of threat and nonaligned spacebased assets.
- Provide tactical space products and support to TAC CP 1, subordinate units of action (UAs), joint, multinational, and interagency forces.
- Participate in the targeting process.
- Provide PVT reliability data and navigation warfare advice, and coordinate GPS enhancement.
- Integrate operational headquarters and Army space unit augmentees into tactical headquarters operations.
- Assist coordinating SATCOM and ISR support.
- Monitor status of missile warning systems.
- Synchronize space operations and effects with the main CP.
- In coordination with SWO, provide weather effects analysis for tactical space operations.
- Develop and update the space portion of the COP.<sup>103</sup>

## **B. CONCEPTS**

### **1. Coordinating Authority**

A commander or individual assigned responsibility for coordinating specific functions or activities involving forces of two or more Military Departments, two or more joint force components, or two or more forces of the same Service. The commander or individual has the authority to require consultation between the agencies involved, but does not have the authority to compel agreement. In the event that essential agreement cannot be obtained, the matter shall be referred to the appointing authority. Coordinating authority is a consultation relationship, not an authority through which command may be exercised. Coordinating authority is more applicable to planning and similar activities than to operations. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)<sup>104</sup>

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<sup>103</sup> Field Manual 3-14: Space Support to Army Operations. E-1.

<sup>104</sup> Joint Publication 0-2, Unified Action Armed Forces (UNAAF). GL-6.

## 2. Space Authority

Commander, USSPACECOM will plan and organize day-to-day operations and publish mission-type orders for future execution by components. To facilitate unity of the theater/joint operations area (JOA) space effort, the supported combatant commander or a joint force commander (JFC) may designate a space authority. The space authority will coordinate space operations, integrate space capabilities, and have primary responsibility for in-theater joint space operations planning. The coordinating authority typically will be the joint force air component commander, joint force land component commander, or joint force maritime component commander. In this position, the space authority designated by the JFC will coordinate space support of established objectives and act on behalf of the combatant commander with primary responsibility in theater for joint space operations planning.<sup>105</sup>

## 3. Space Coordinating Authority (SCA)

Within a regional operation, the JFC should designate SCA to facilitate unity of effort with DOD-wide space operations and non-DOD space capabilities. **Although JFCs may retain authority at the JTF level, they should normally designate as SCA the component commander who provides the preponderance of military space capabilities, the requisite ability to command and control them, and the resident space expertise.** In most cases, the JFACC provides these capabilities through the Air Force's organic space C2 infrastructure. Responsibilities of SCA include:

- Determine, deconflict, and prioritize military space requirements for the JTF.
- Recommend appropriate command relationships for space to the JFC.
- Help facilitate space target nomination.
- Maintain space situational awareness.
- Request space inputs from JTF staff and components during planning.
- Ensure optimum interoperability of space assets with coalition forces.

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<sup>105</sup> Joint Publication 3-14: Joint Doctrine for Space Operations. ix.



- Recommend JTF military space requirement priorities to JFC.<sup>106</sup>

#### 4. Joint Warfighting Space (JWS)

Ultimately, the JWS concept is about ensuring that space/near-space systems and capabilities *emerge as an organic part of the joint task force* conducting military operations in theater. The concept aims to provide operationally responsive access to and the tactical exploitation of space/near-space. The JWS concept is best characterized as a responsive, end-to-end networked set of space/near-space capabilities dedicated to the JFC and integrated with NSS systems. The JWS concept calls for the deployment of expeditionary space forces that deliver responsive space capabilities to the JFC to achieve operational and tactical effects in support of assigned missions. The three components that follow are central to the idea and success of the JWS concept.

- **Expeditionary Space Force.** There are several key elements of JWS, but *the centerpiece or success mechanism of the concept is an expeditionary space force of people and organizations*. The tailored force of space professionals who design, develop, plan, employ and operate space capabilities are the essential component in achieving the JFC's desired effects. In any given situation, a whole JWS force package may be required or just a specific UTC. These pre-planned packages provide the JFC the means to employ a tailored JWS capability as mission needs dictate. The JWS organization will be trained and tailored to rapidly deploy under operational control or tactical control of the JFC to deliver responsive space capabilities and meet JFC needs. As elements of the expeditionary space/near-space force deploy to theater, geographically separated from their parent space organization, they remain fully integrated with global, as well as theater organic space forces to completely exploit national and DoD space assets in support of the JFC.
- **Responsive and Tailored Space Systems/Capabilities.** JWS relies on the continued use of existing space capabilities in order to deliver additional or new capabilities to a supported theater commander. Advanced technology development is a principle element of this feature of JWS that enables the development of key capabilities including: responsive, affordable space lift; on-orbit assets with theater-tailored payloads that are

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<sup>106</sup> Air Force Doctrine Document 2, Operations and Organization. 63.

operational without delay; near-space assets with tailorable payloads, launchable in or near the theater; machine-to-machine collaboration between space and air, ground and sea assets; dynamic tasking of space/near-space systems; tactical control of payload and dissemination of data; on-demand payload/sensor capacities especially in the ISR, SATCOM and counterspace mission areas; and prompt global precision conventional strike

- **Integrated JWS Operations.** Integrated JWS operations are essential to speed, precision and responsiveness, all traits desired in support of full spectrum operations. JWS capabilities will be developed with the operational or tactical user in mind. *Fully integrated JWS operations must occur across three specific areas: global and theater space integration; integration of space with the other domains of air, land, sea and information; and the horizontal integration of JWS with other NSS systems.* While global and theater dedicated space forces differ in their area of interest, global and theater integration is essential to assure real time planning, deconfliction and coordinated effects in execution. This level of integration will be facilitated since the expeditionary forces are assigned day-to-day under the global space component.<sup>107</sup>

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<sup>107</sup> U.S. Air Force, "Operating Concept for Joint Warfighting Space (Draft)," 13 Jan 2005, 9.

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